

AD-781 792

STATIC RADAR CROSS SECTION OF LIGHT
AIRCRAFT. VOLUME III. PIPER PA-18
SUPER CUB AT L-, S-, AND C-BANDS

Test Group (6585th)

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16. Abstract Static radar cross section (RCS) of a single-engine fabric-covered Piper PA-18 Super Cub high wing monoplane was measured at 2700, 2800 and 2900 MHz over a range of aircraft attitudes of $\pm 10^\circ$ pitch, 0° to 45° roll, and also at 1250, 1350, 5000, and 5400 MHz at 0° roll, 0° pitch. Median RCS was independent of frequency in linear polarization and in circular polarization. The RCS was insensitive to roll, pitch, and yaw except in the two broadside directions under conditions of increasing roll angle. The report includes copies of the original recorded RCS patterns.					
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SECTION I

1. Introduction

This document is Volume III of a three-volume set (References 1 and 2) on measurement of static radar cross section (RCS) of light aircraft. The measurement program comprised three types of single-engined aircraft:

- a. All-metal high wing
- b. All-metal low wing
- c. Fabric-covered (high wing)

Type (c), represented by a Piper PA-18 Super Cub is the subject of this report. Measurements on a Cessna 150L, typical of type (a), are presented in Volume I (Reference 1), and the data on type (b), a Cherokee 140, are given in Volume II (Reference 2).

The objective of the program was to measure static RCS of typical light aircraft over a range of frequencies, polarizations, and aspect angles. These data would aid in defining the need for and amount of RCS enhancement on light aircraft to improve their visibility on FAA airport surveillance radars.

The data measurements were made at the Radar Target Scatter Division (RAT SCAT) of the 6585th Test Group located on the Alkali Flats, Holloman Air Force Base, New Mexico.

2. Description of Target

The RCS data presented in this report were measured on a Model PA-18 Super Cub manufactured by the Piper Aircraft Corporation, Lock Haven, Pennsylvania.

The aircraft was being re-furbished by the owners and was not in flying condition at the time of test although the basic structure and equipment were complete in all respects. The aircraft was trucked to the RAT SCAT test site where it was assembled and rigged. Figure 1 shows the aircraft mounted for test at zero degrees roll and zero degrees pitch. There were no antennas on the aircraft. The control surfaces were locked in neutral and the cabin door on the starboard side was closed.

3. Instrumentation

Data measurement was achieved with a long-pulse radar system operating on a ground plane range. Figure 2 illustrates the components

of the measurement range. The radar transmitter, receiver, control console, and data recorders were housed in a mobile van. The antennas were supported on a mobile tower. Rotation of the target in azimuth was controlled from the van through underground electrical conduit that also returned azimuth synchro signals to the van. A mobile test van was used on this program in order to operate over a range length not available on the RAT SCAT fixed ranges. Sections 1 and 2 of Appendix A and Table A-1 of Appendix A summarize the characteristics of RAT SCAT facilities and equipment. This information applies to the mobile-mounted equipment used for this program as well as to the fixed installations.

The RCS measurements presented in this report were obtained on a ground plane range wherein the target is measured near to the ground. The ground is present as a scattering object and in such a circumstance coupling between orthogonal components of the transmitted and received fields may exist other than the coupling introduced by the target. This coupling (or depolarizing) can be a problem only for measurement in circular polarization. References 3 and 4 describe the theoretical and experimental studies made on the subject specifically for the RAT SCAT range. It was shown that circular polarization measurements can be made on a ground plane range. The size of the useful target region is approximately the same when circular polarization is used as that obtained when linear polarization is used. The amplitude curvature in the vertical plane is the limiting factor in both cases. Standardized calibration procedures used at RAT SCAT assure the accuracy of RCS measurements using circular polarization.

The primary calibration standard for linear polarization was a 26.6 inch diameter precision aluminum sphere and was used at all measurement frequencies. The calibration standard for circular polarization was a ninety-degree dihedral corner with square faces 0.85 meters in each dimension. This corner was calibrated against the precision sphere, making use of a 45° dipole to transfer from linear to circular polarization. The secondary reference standard was a trihedral corner placed approximately at mid-range (see Figure 2). The RCS level of this reference standard was used to set the decibel scale on all recorded RCS patterns and was utilized for both linear and circular polarization.

The radar antennas were parabolic dishes with dipole feeds for linear polarization and planar spiral feeds for circular polarization. Circularity was better than 0.7 dB at all frequencies.

4. Procedure

Data on this program were obtained at seven frequencies and three polarizations over a range of roll and pitch angles as summarized in Table I.

Table I - RCS Measurement Matrix

Freq. (MHz)	Polarization	Roll Angle (Degrees)	Pitch Angle (Degrees)
1250	VV,HH,RR	0	0
1350	VV,HH,RR	0	0
2700	VV,--,RR	0,5,10,20,30,45	-10,-5,0,+5,+10
2800	VV,HH,RR	0,5,10,20,30,45	-10,-5,0,+5,+10
2900	VV,--,RR	0,5,10,20,30,45	-10,-5,0,+5,+10
5000	VV,HH,--	0	0
5400	VV,HH,--	0	0

The first letter designating polarization defines the polarization of the transmit antenna, the second letter defines polarization of the receive antenna. The nomenclature follows common practice in which only the spatial orientation of the electric field vector is specified: V for vertical, H for horizontal, R for right-hand circular.

The aircraft was supported at the azimuth turntable on two dielectric columns. The two columns were expanded polystyrene foam fabricated in vertical wedge sections to form a cone with circular cross section. On top of each column was a cylindrical transition section of polystyrene contoured on the upper ends to match the curvature of polystyrene rings attached to the aircraft fuselage. The rings transferred the mounting loads into the fuselage welded steel tube framework in order to avoid damage to the outer fabric covering. The forward ring was in the plane of the firewall.

The aircraft was lifted by a mobile crane and carefully lowered onto the transition sections on top of each column. Lengths of parachute cord tied to the fuselage, tail wheel, and wing struts were anchored to winches fastened on the azimuth turntable. The transition sections on the two columns established the aircraft pitch angle while roll angle was achieved simply by rolling the aircraft on the support rings. Final adjustment of pitch and roll was achieved by altering tension in various tie-down cords in whatever combination was necessary. Roll and pitch angle were measured at the propeller hub. With the propeller rotated to an index line roll angle was measured with a transit sighting on a protractor fixed to the propeller hub. Pitch angle was measured on the front

of the propeller hub with an inclinometer. Pitch angle thus was measured with respect to the axis of the engine crankshaft. Both roll and pitch were set to an accuracy of ± 0.5 degrees.

Figure 1 shows the Super Cub mounted on the columns and ready for measurement at zero degrees roll, zero degrees pitch. The two support rings were made of two pound per cubic foot density expanded polystyrene foam and were in place for all RCS measurements.

Target height was 14 feet at L- and C-Bands, 16 feet at S-Band. Target height is the vertical distance between ground level and a horizontal line (the pitch axis) through the half height of the fuselage midway between aircraft nose and tail, measured with the aircraft in level flight attitude. Figure 3 illustrates the relation between target height and the axes of pitch and yaw.

A target being measured on a ground plane range is in an electromagnetic field that is the vector sum of (1) the wave energy that travels directly from antenna to target, (2) the wave energy reflected from the surface of the earth, and (3) the wave energy that travels along the surface of the earth. The vector sum produces an interference pattern. Antenna height is adjusted so that the target is located in the first lobe of the interference pattern described by the equation

$$H_a = \frac{\lambda R}{4H_t}$$

where H_a is antenna height, H_t is target height, λ is wavelength, and R is range length. In order to obtain accurate RCS measurements the following steps are required:

- (a) Adjust antenna height and pointing direction for best field uniformity across the volume occupied by the target.
- (b) Tilt the azimuth turntable so the target rotates in the plane of the antenna beam.
- (c) Minimize reflections from target supports, tie-downs and turntable.
- (d) Calibrate the range at all frequencies and polarizations.

The range parameters used on the program after the above steps were carried out at each frequency are summarized in Table II.

Measurement of RCS began with the three frequencies in S-Band: 2700 MHz, 2800 MHz and 2900 MHz. Because of the large effort required

to mount the target for measurement it was prudent to record as many RCS patterns as possible for each mounting of the target. For that reason four antennas were used: one pair for linear polarization, the other pair for circular polarization. The antenna pairs were switched to the radar transmitter and receiver as required. That arrangement allowed measurement of seven RCS patterns for each roll/pitch attitude of the target. If weather conditions remained favorable upon completion of such a pattern group the target was set to the next roll/pitch attitude and RCS measurement continued until dark at which time a post-test calibration was then made. If weather became unfavorable (wind velocity above 10 knots, or rain) the target was removed from the turntable and the post-test calibration was made as quickly as possible. In any event the aircraft was not measured in wind velocity above 10 knots or after dark, and the range was calibrated before and after a sequence of measurement. The post-test calibration for one day was not used as the pre-test calibration for the next sequence of measurement. Each day began with a new calibration.

At L-Band (1250 MHz and 1350 MHz) one pair of antennas was used instead of two pair because only one target roll/pitch attitude was measured (see Table I). The two linear patterns were measured at each frequency followed by the post-test calibration. The linear feeds were replaced by the circular feeds and a new calibration was made at the two frequencies. The required patterns in circular polarization were then measured and were followed by a post-test calibration.

5. Results

The RCS patterns presented in this report are copies of the original recorded data. Each pattern includes a calibration reference level from which the decibel scale was labelled. Each pattern also is marked with azimuth angle (horizontal scale at the bottom), and is identified as to pitch and roll angle, all of which are defined in Appendix B.

The RCS of the Super Cub was fairly insensitive to roll, pitch and yaw (azimuth angle) except in the broadside directions with increasing roll angle. The aircraft structure consisted of a metal framework covered by fabric that had a fire-retardant plastic finish. The outer surface of the aircraft was thus a thin dielectric layer. The aircraft RCS was the combination of reflections from the dielectric surface and from the large number of conductive elements (pipe, angles, plates) making up the aircraft load-bearing structure. The conductive elements presented to the incident radar field a wide range of lengths, polarizations, and areas that changed only slightly with aspect angle (except in the broadside directions at increasing roll angles). The result was a uniform RCS response.

With the aircraft at zero degrees roll and zero degrees pitch the median RCS in linear polarization and in circular polarization was independent of frequency over the range of measurement. In linear polarization the median RCS was the same for VV as for HH.

The measured RCS patterns show the affect of frequency only for the zero degrees roll, zero degrees pitch attitude of the aircraft. It can be noted that the ratio of fuselage length (6.88m) to wavelength is between 288 and 124 over the measured frequency range, indicating that RCS is in the geometric optics region. From this it can be inferred that median RCS may be independent of frequency at all attitudes of the aircraft.

Figure 4 indicates the affect of positive roll angle (at zero degrees pitch) on median RCS at 2800 MHz, VV polarization. Contours of median RCS in dbsm are plotted in the azimuth-roll plane. (Median RCS was computed for a 10 degree azimuth increment with a 5 degree overlap). Vertical lines through the plot indicate the affect of roll angle at a given azimuth direction. Variation of RCS with roll angle was greatest in the two broadside directions, i.e. near 90° azimuth and 270° azimuth. In the 270° azimuth direction where the radar viewed the underside of the wing and fuselage as the aircraft rolled the RCS displayed three peaks and two 5 db deep nulls in rolling to 45 degrees. In the 90° azimuth direction (the radar viewed the upper surface of wing and fuselage) the RCS displayed two peaks and one 8 db deep null for the same 45 degrees of roll. In other azimuth directions the RCS varied 2 db or less over 45 degrees of roll.

6. References

1. AFSWC-TR-73-46, Volume I, Static RCS of Light Aircraft, Cessna 150L at L-, S-, C-Band, December 1973.
2. AFSWC-TR-73-46, Volume II, Static RCS of Light Aircraft, Cherokee 140 at L-, S-, C-Band, December 1973.
3. RADC-TDR-63-484, An Analysis of the Polarization Capabilities of a Ground Plane Cross Section Range, October 1963.
4. RADC-TDR-64-380, Experimental Results of Circular Polarization and Scattering Matrix Measurements, June 1964.

Table II Test Range Parameters for Super Cub RCS Measurements

Freq. (MHz)	Target Ht. (ft)	Antenna Ht.	Antenna Diameter (ft)	Range (ft)	Table Tilt (Min)
1250	14	12'-6"	10	1150	42
1350	14	12'-6"	10	1150	42
2700	16	12'-6"	6	2100	26
2800	16	12'-6"	6	2100	26
2900	16	12'-6"	6	2100	26
5000	14	6'-5"	4	2100	23
5400	14	5'-10"	4	2100	23



Figure 1. PIPER PA-18 Super Cub Mounted On Columns For
RCS Measurements at 0° Roll, 0° Pitch.

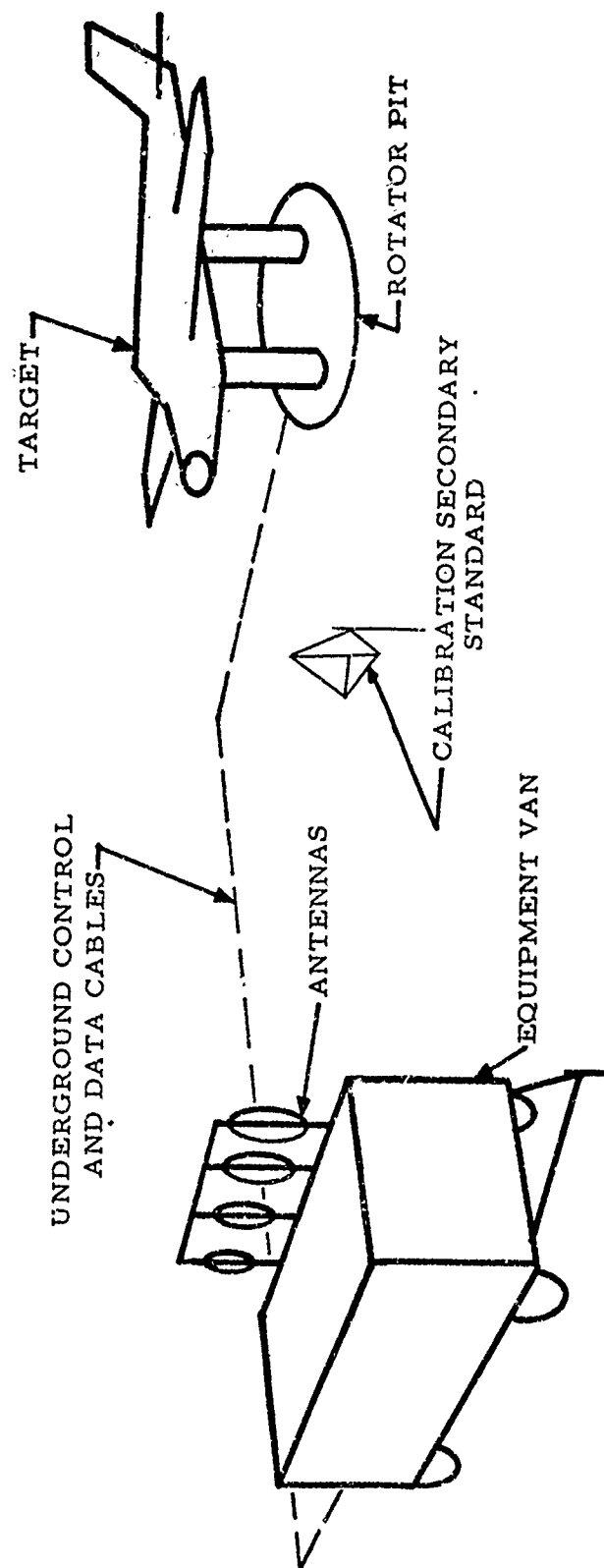


Figure 2. Elements of the Radar Measurement Range

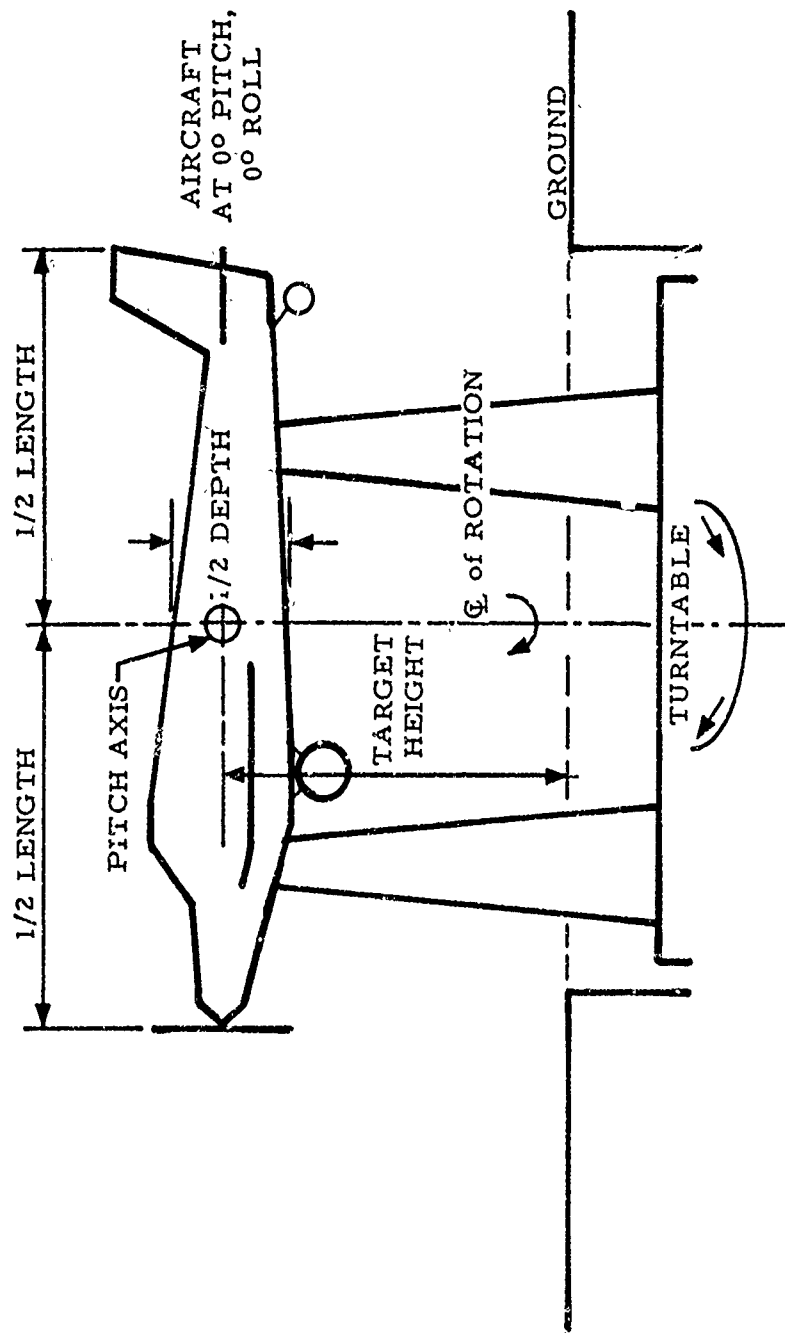


Figure 3. Aircraft Mounting Geometry Showing Location of Pitch Axis, Yaw Axis and Designation of Target Height

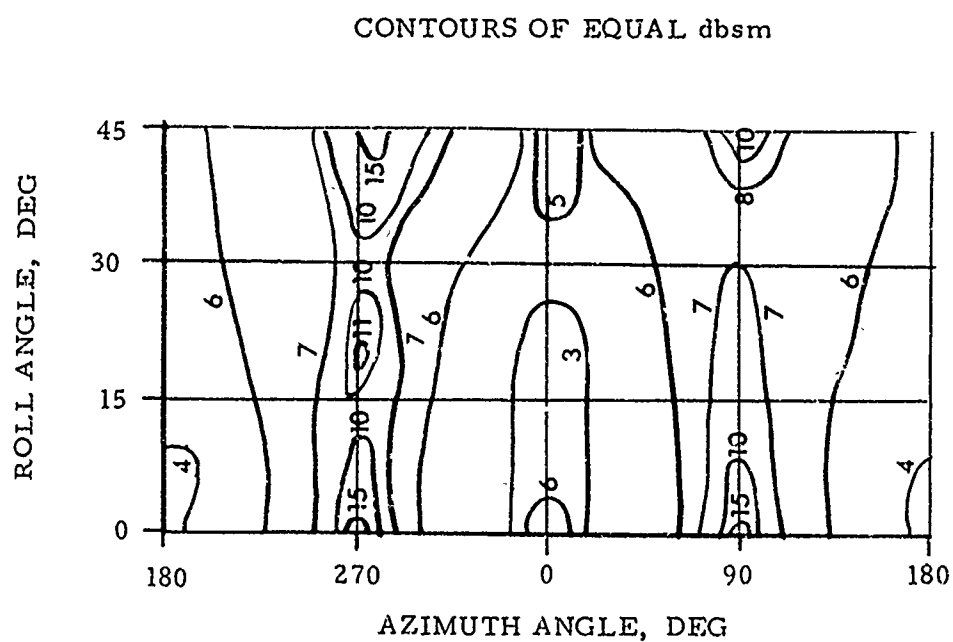


Figure 4. Affect of Roll Angle on Median RCS
at 2800MHz, VV Polarization

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Table III

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Sheet 1

PAGE NO.	RUN	FREQ (MHz)	POLARIZATION	PITCH ANGLE	ROLL ANGLE	TARGET CONFIGURATION AND REMARKS
20	1023	2700	VV	-10	0	Super Cub PA-18 Airplane
21	1035	2700	VV	-5	0	Super Cub PA-18 Airplane
22	892	2700	VV	0	0	Super Cub PA-18 Airplane
23	1113	2700	VV	+5	0	Super Cub PA-18 Airplane
24	1134	2700	VV	+10	0	Super Cub PA-18 Airplane
25	1022	2700	VV	-10	5	Super Cub PA-18 Airplane
26	1037	2700	VV	-5	5	Super Cub PA-18 Airplane
27	905	2700	VV	0	5	Super Cub PA-18 Airplane
28	1100	2700	VV	+5	5	Super Cub PA-18 Airplane
29	1135	2700	VV	+10	5	Super Cub PA-18 Airplane
30	1009	2700	VV	-10	10	Super Cub PA-18 Airplane
31	1058	2700	VV	-5	10	Super Cub PA-18 Airplane
32	906	2700	VV	0	10	Super Cub PA-18 Airplane
33	1099	2700	VV	+5	10	Super Cub PA-18 Airplane
34	1148	2700	VV	+10	10	Super Cub PA-18 Airplane
35	1007	2700	VV	-10	20	Super Cub PA-18 Airplane
36	1071	2700	VV	-5	20	Super Cub PA-18 Airplane
37	913	2700	VV	0	20	Super Cub PA-18 Airplane
38	1086	2700	VV	+5	20	Super Cub PA-18 Airplane
39	1149	2700	VV	+10	20	Super Cub PA-18 Airplane
40	982	2700	VV	-10	30	Super Cub PA-18 Airplane
41	1072	2700	VV	-5	30	Super Cub PA-18 Airplane
42	934	2700	VV	0	30	Super Cub PA-18 Airplane
43	1085	2700	VV	+5	30	Super Cub PA-18 Airplane
44	1156	2700	VV	+10	30	Super Cub PA-18 Airplane
45	969	2700	VV	-10	45	Super Cub PA-18 Airplane
46	948	2700	VV	-5	45	Super Cub PA-18 Airplane
47	947	2700	VV	0	45	Super Cub PA-18 Airplane
48	1197	2700	VV	+5	45	Super Cub PA-18 Airplane
49	1184	2700	VV	+10	45	Super Cub PA-18 Airplane
50	1163	2700	VV	N/A	N/A	Super Cub PA-18 Airplane
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Sheet 2

Table III

PAGE NO.	RUN	FREQ (MHz)	POLARIZATION	PITCH ANGLE	ROLL ANGLE	TARGET CONFIGURATION AND REMARKS
51	1024	2700	RR	-10	0	Super Cub PA-18 Airplane
52	1036	2700	RR	-5	0	Super Cub PA-18 Airplane
53	893	2700	RR	0	0	Super Cub PA-18 Airplane
54	1112	2700	RR	+5	0	Super Cub PA-18 Airplane
55	1133	2700	RR	+10	0	Super Cub PA-18 Airplane
56	1021	2700	RR	-10	5	Super Cub PA-18 Airplane
57	1038	2700	RR	-5	5	Super Cub PA-18 Airplane
58	904	2700	RR	0	5	Super Cub PA-18 Airplane
59	1101	2700	RR	+5	5	Super Cub PA-18 Airplane
60	1136	2700	RR	+10	5	Super Cub PA-18 Airplane
61	1010	2700	RR	-10	10	Super Cub PA-18 Airplane
62	1059	2700	RR	-5	10	Super Cub PA-18 Airplane
63	907	2700	RR	0	10	Super Cub PA-18 Airplane
64	1098	2700	RR	+5	10	Super Cub PA-18 Airplane
65	1147	2700	RR	+10	10	Super Cub PA-18 Airplane
66	1006	2700	RR	-10	20	Super Cub PA-18 Airplane
67	1070	2700	RR	-5	20	Super Cub PA-18 Airplane
68	914	2700	RR	0	20	Super Cub PA-18 Airplane
69	1087	2700	RR	+5	20	Super Cub PA-18 Airplane
70	1150	2700	RR	+10	20	Super Cub PA-18 Airplane
71	983	2700	RR	+10	20	Super Cub PA-18 Airplane
72	1073	2700	RR	-10	30	Super Cub PA-18 Airplane
73	935	2700	RR	-5	30	Super Cub PA-18 Airplane
74	1084	2700	RR	+5	30	Super Cub PA-18 Airplane
75	1157	2700	RR	+10	30	Super Cub PA-18 Airplane
76	970	2700	RR	-10	45	Super Cub PA-18 Airplane
77	949	2700	RR	-5	45	Super Cub PA-18 Airplane
78	946	2700	RR	0	45	Super Cub PA-18 Airplane
79	1196	2700	RR	+5	45	Super Cub PA-18 Airplane
80	1145	2700	RR	+10	45	Super Cub PA-18 Airplane
81	1164	2700	RR	N/A	N/A	Super Cub PA-18 Airplane
						Background with columns and transitions

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Table III

DATA PLOT INDEX

Sheet 3

PAGE NO.	RUN	FREQ (MHz)	POLARIZATION	PITCH ANGLE	ROLL ANGLE	TARGET CONFIGURATION AND REMARKS
82	1027	2800	VV	-10	0	Super Cub PA-18 Airplane
83	1034	2800	VV	-5	0	Super Cub PA-18 Airplane
84	896	2800	VV	0	0	Super Cub PA-18 Airplane
85	1109	2800	VV	+5	0	Super Cub PA-18 Airplane
86	1132	2800	VV	+10	0	Super Cub PA-18 Airplane
87	1020	2800	VV	-10	5	Super Cub PA-18 Airplane
88	1041	2800	VV	-5	5	Super Cub PA-18 Airplane
89	901	2800	VV	0	5	Super Cub PA-18 Airplane
90	1102	2800	VV	+5	5	Super Cub PA-18 Airplane
91	1139	2800	VV	+10	5	Super Cub PA-18 Airplane
92	1013	2800	VV	-10	10	Super Cub PA-18 Airplane
93	1062	2800	VV	-5	10	Super Cub PA-18 Airplane
94	910	2800	VV	0	10	Super Cub PA-18 Airplane
95	1095	2800	VV	+5	10	Super Cub PA-18 Airplane
96	1146	2800	VV	+10	10	Super Cub PA-18 Airplane
97	1001	2800	VV	-10	20	Super Cub PA-18 Airplane
98	1067	2800	VV	-5	20	Super Cub PA-18 Airplane
99	917	2800	VV	0	20	Super Cub PA-18 Airplane
100	1090	2800	VV	+5	20	Super Cub PA-18 Airplane
101	1153	2800	VV	+10	20	Super Cub PA-18 Airplane
102	980	2800	VV	-10	30	Super Cub PA-18 Airplane
103	1076	2800	VV	-5	30	Super Cub PA-18 Airplane
104	938	2800	VV	0	30	Super Cub PA-18 Airplane
105	1081	2800	VV	+5	30	Super Cub PA-18 Airplane
106	1160	2800	VV	+10	30	Super Cub PA-18 Airplane
107	973	2800	VV	-10	45	Super Cub PA-18 Airplane
108	952	2800	VV	-5	45	Super Cub PA-18 Airplane
109	943	2800	VV	0	45	Super Cub PA-18 Airplane
110	1193	2800	VV	+5	45	Super Cub PA-18 Airplane
111	1188	2800	VV	+10	45	Super Cub PA-18 Airplane
112	1166	2800	VV	N/A	N/A	Super Cub PA-18 Airplane
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CONTROL NUMBER 73-01 DATA PLOT INDEX Table III Sheet 4

PAGE NO.	RUN	FREQ (MHz)	POLARIZATION	PITCH ANGLE	ROLL ANGLE	TARGET CONFIGURATION AND REMARKS
113	1025	2800	HH	-10	0	Super Cub PA-18 Airplane
114	1032	2800	HH	-5	0	Super Cub PA-18 Airplane
115	895	2800	HH	0	0	Super Cub PA-18 Airplane
116	1111	2800	HH	+5	0	Super Cub PA-18 Airplane
117	1131	2800	HH	+10	0	Super Cub PA-18 Airplane
118	1019	2800	HH	-10	5	Super Cub PA-18 Airplane
119	1039	2800	HH	-5	5	Super Cub PA-18 Airplane
120	902	2800	HH	0	5	Super Cub PA-18 Airplane
121	1104	2800	HH	+5	5	Super Cub PA-18 Airplane
122	1138	2800	HH	+10	5	Super Cub PA-18 Airplane
123	1012	2800	HH	-10	10	Super Cub PA-18 Airplane
124	1061	2800	HH	-5	10	Super Cub PA-18 Airplane
125	908	2800	HH	0	10	Super Cub PA-18 Airplane
126	1097	2800	HH	+5	10	Super Cub PA-18 Airplane
127	1145	2800	HH	+10	10	Super Cub PA-18 Airplane
128	1002	2800	HH	-10	20	Super Cub PA-18 Airplane
129	1068	2800	HH	-5	20	Super Cub PA-18 Airplane
130	915	2800	HH	0	20	Super Cub PA-18 Airplane
131	1089	2800	HH	+5	20	Super Cub PA-18 Airplane
132	1152	2800	HH	+10	20	Super Cub PA-18 Airplane
133	979	2800	HH	-10	30	Super Cub PA-18 Airplane
134	1075	2100	HH	-5	30	Super Cub PA-18 Airplane
135	937	2800	HH	0	30	Super Cub PA-18 Airplane
136	1082	2800	HH	+5	30	Super Cub PA-18 Airplane
137	1159	2800	HH	+10	30	Super Cub PA-18 Airplane
138	972	2800	HH	-10	45	Super Cub PA-18 Airplane
139	951	2800	HH	-5	45	Super Cub PA-18 Airplane
140	944	2800	HH	0	45	Super Cub PA-18 Airplane
141	1194	2800	HH	+5	45	Super Cub PA-18 Airplane
142	1187	2800	HH	+10	45	Super Cub PA-18 Airplane
143	1167	2800	HH	N/A	N/A	Background with columns and transitions
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Table III

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Sheet 5

PAGE NO.	RUN	FREQ (MHz)	POLARIZATION	PITCH ANGLE	ROLL ANGLE	TARGET CONFIGURATION AND REMARKS
144	1026	2800	RR	-10	0	Super Cub PA-18 Airplane
145	1033	2800	RR	-5	0	Super Cub PA-18 Airplane
146	894	2800	RR	0	0	Super Cub PA-18 Airplane
147	1110	2800	RR	+5	0	Super Cub PA-18 Airplane
148	1130	2800	RR	+10	0	Super Cub PA-18 Airplane
149	1018	2800	RR	-10	5	Super Cub PA-18 Airplane
150	1040	2800	RR	-5	5	Super Cub PA-18 Airplane
151	903	2800	RR	0	5	Super Cub PA-18 Airplane
152	1103	2800	RR	+5	5	Super Cub PA-18 Airplane
153	1137	2800	RR	+10	5	Super Cub PA-18 Airplane
154	1011	2800	RR	-10	10	Super Cub PA-18 Airplane
155	1060	2800	RR	-5	10	Super Cub PA-18 Airplane
156	909	2800	RR	0	10	Super Cub PA-18 Airplane
157	1096	2800	RR	+5	10	Super Cub PA-18 Airplane
158	1144	2800	RR	+10	10	Super Cub PA-18 Airplane
159	1008	2800	RR	-10	20	Super Cub PA-18 Airplane
160	1069	2800	RR	-5	20	Super Cub PA-18 Airplane
161	916	2800	RR	0	20	Super Cub PA-18 Airplane
162	1088	2800	RR	+5	20	Super Cub PA-18 Airplane
163	1151	2800	RR	+10	20	Super Cub PA-18 Airplane
164	978	2800	RR	-10	30	Super Cub PA-18 Airplane
165	1074	2800	RR	-5	30	Super Cub PA-18 Airplane
166	936	2800	RR	0	30	Super Cub PA-18 Airplane
167	1083	2800	RR	+5	30	Super Cub PA-18 Airplane
168	1158	2800	RR	+10	30	Super Cub PA-18 Airplane
169	971	2800	RR	-10	45	Super Cub PA-18 Airplane
170	950	2800	RR	-5	45	Super Cub PA-18 Airplane
171	945	2800	RR	0	45	Super Cub PA-18 Airplane
172	1195	2800	RR	+5	45	Super Cub PA-18 Airplane
173	1186	2800	RR	+10	45	Super Cub PA-18 Airplane
174	1165	2800	RR	N/A	N/A	Super Cub PA-18 Airplane
						Background with columns and transitions

NBD 72-007

PAGE NO.	RUN	FREQ (MHz)	POLARIZATION	PITCH ANGLE	ROLL ANGLE	TARGET CONFIGURATION AND REMARKS
175	1028	2900	VV	-10	0	Super Cub PA-18 Airplane
176	1030	2900	VV	-5	0	Super Cub PA-18 Airplane
177	898	2900	VV	0	0	Super Cub PA-18 Airplane
178	1107	2900	VV	+5	0	Super Cub PA-18 Airplane
179	1128	2900	VV	+10	0	Super Cub PA-18 Airplane
180	1016	2900	VV	-10	5	Super Cub PA-18 Airplane
181	1042	2900	VV	-5	5	Super Cub FA-18 Airplane
182	899	2900	VV	0	5	Super Cub PA-18 Airplane
183	1106	2900	VV	+5	5	Super Cub PA-18 Airplane
184	1141	2900	VV	+10	5	Super Cub PA-18 Airplane
185	1015	2900	VV	-10	10	Super Cub PA-18 Airplane
186	1064	2900	VV	-5	10	Super Cub PA-18 Airplane
187	911	2900	VV	0	10	Super Cub PA-18 Airplane
188	1093	2900	VV	+5	10	Super Cub PA-18 Airplane
189	1142	2900	VV	+10	10	Super Cub PA-18 Airplane
190	1004	2900	VV	-10	20	Super Cub PA-18 Airplane
191	1065	2900	VV	-5	20	Super Cub PA-18 Airplane
192	918	2900	VV	0	20	Super Cub PA-18 Airplane
193	1092	2900	VV	+5	20	Super Cub PA-18 Airplane
194	1155	2900	VV	+10	20	Super Cub PA-18 Airplane
195	976	2900	VV	-10	30	Super Cub PA-18 Airplane
196	1078	2900	VV	-5	30	Super Cub PA-18 Airplane
197	940	2900	VV	0	30	Super Cub PA-18 Airplane
198	1079	2900	VV	+5	30	Super Cub PA-18 Airplane
199	1162	2900	VV	+10	30	Super Cub PA-18 Airplane
200	975	2900	VV	-10	45	Super Cub PA-18 Airplane
201	954	2900	VV	-5	45	Super Cub PA-18 Airplane
202	941	2900	VV	0	45	Super Cub PA-18 Airplane
203	1191	2900	VV	+5	45	Super Cub PA-18 Airplane
204	1190	2900	VV	+10	45	Super Cub PA-18 Airplane
205	1169	2900	VV	N/A	N/A	Background with columns and transitions
	----	----	----	----	----	-----

CONTROL NUMBER 73-01

Table III

DATA PLOT INDEX

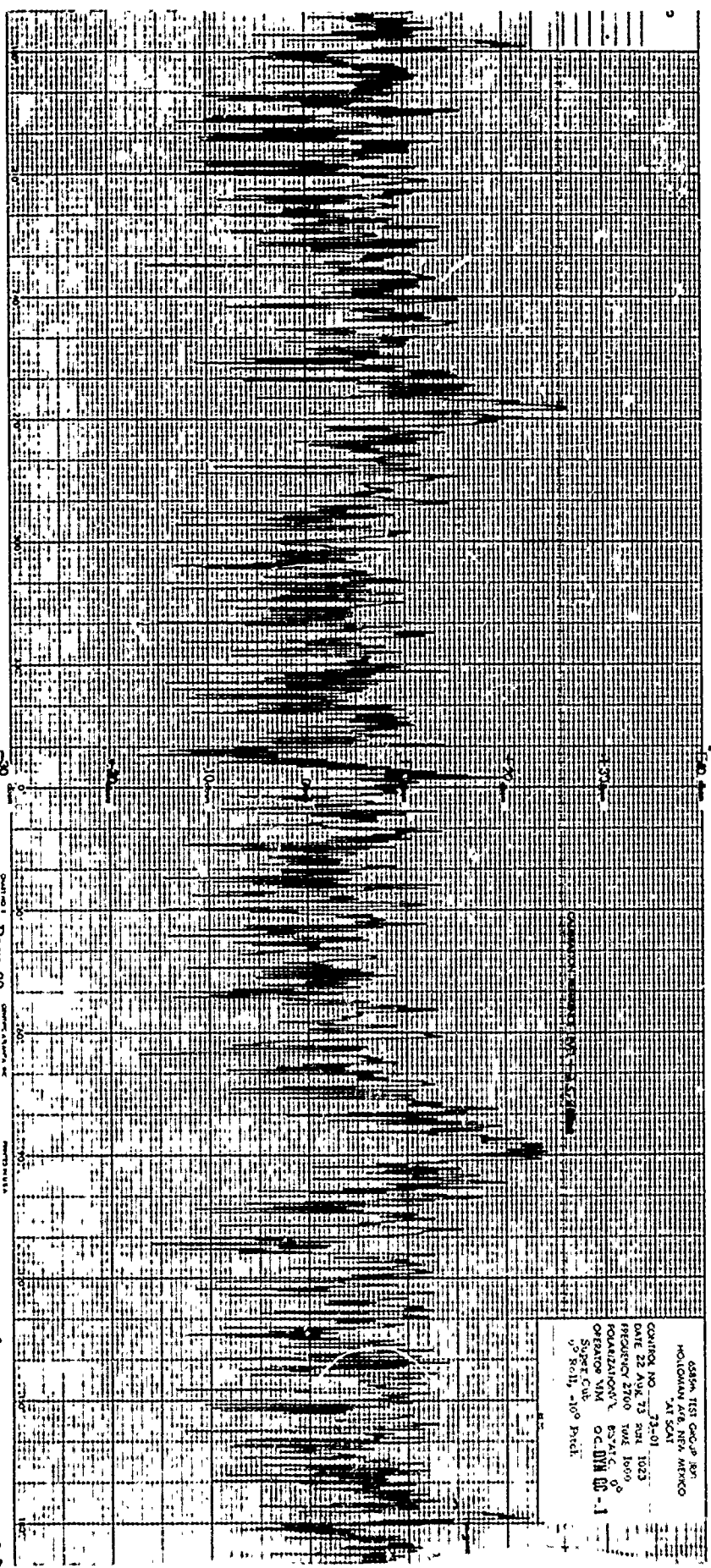
Sheet 7

PAGE NO.	RUN	FREQ (MHz)	POLARIZATION	PITCH ANGLE	ROLL ANGLE	TARGET CONFIGURATION AND REMARKS
206	1029	2900	RR	-10	0	Super Cub PA-18 Airplane
207	1031	2900	RR	-5	0	Super Cub PA-18 Airplane
208	897	2900	RR	0	0	Super Cub PA-18 Airplane
209	1108	2900	RR	+5	0	Super Cub PA-13 Airplane
210	1129	2900	RR	+10	0	Super Cub PA-18 Airplane
211	1017	2900	RR	-10	5	Super Cub PA-18 Airplane
212	1043	2900	RR	-5	5	Super Cub PA-18 Airplane
213	900	2900	RR	0	5	Super Cub PA-18 Airplane
214	1105	2900	RR	+5	5	Super Cub PA-18 Airplane
215	1140	2900	RR	+10	5	Super Cub PA-18 Airplane
216	1014	2900	RR	-10	10	Super Cub PA-18 Airplane
217	1063	2900	RR	-5	10	Super Cub PA-18 Airplane
218	912	2900	RR	0	10	Super Cub PA-18 Airplane
219	1094	2900	RR	+5	10	Super Cub PA-18 Airplane
220	1143	2900	RR	+10	10	Super Cub PA-18 Airplane
221	1003	2900	RR	-10	20	Super Cub PA-18 Airplane
222	1066	2900	RR	-5	20	Super Cub PA-18 Airplane
223	919	2900	RR	0	20	Super Cub PA-18 Airplane
224	1091	2900	RR	+5	20	Super Cub PA-18 Airplane
225	1154	2900	RR	+10	20	Super Cub PA-18 Airplane
226	977	2900	RR	-10	30	Super Cub PA-18 Airplane
227	1077	2900	RR	-5	30	Super Cub PA-18 Airplane
228	939	2900	RR	0	30	Super Cub PA-18 Airplane
229	1080	2900	RR	+5	30	Super Cub PA-18 Airplane
230	1161	2900	RR	+10	30	Super Cub PA-18 Airplane
231	974	2900	RR	-10	45	Super Cub PA-18 Airplane
232	953	2900	RR	-5	45	Super Cub PA-18 Airplane
233	942	2900	RR	-5	45	Super Cub PA-18 Airplane
234	1192	2900	RR	+5	45	Super Cub PA-18 Airplane
235	1189	2900	RR	+10	45	Super Cub PA-18 Airplane
236	1168	2900	RR	N/A	N/A	Background with various transitions

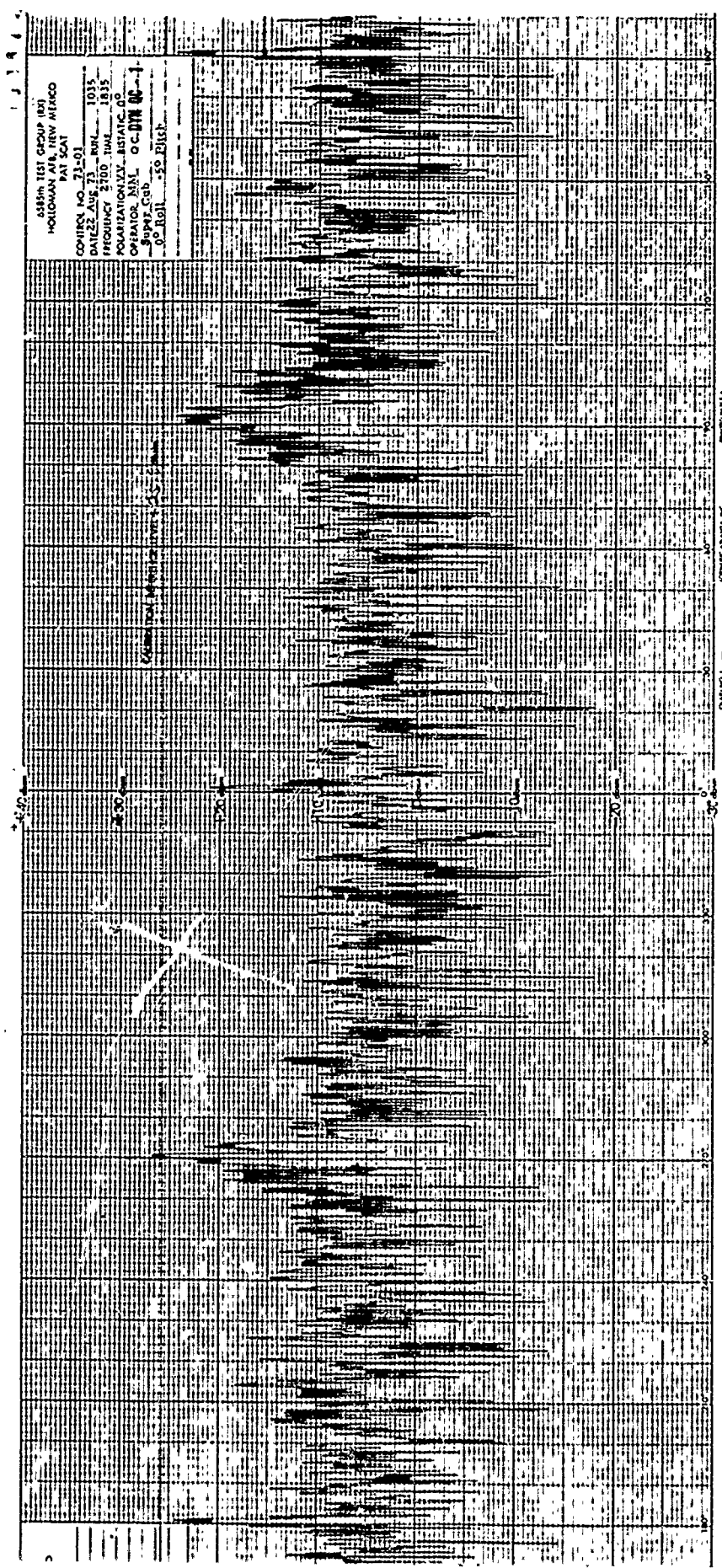
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 best available copy.

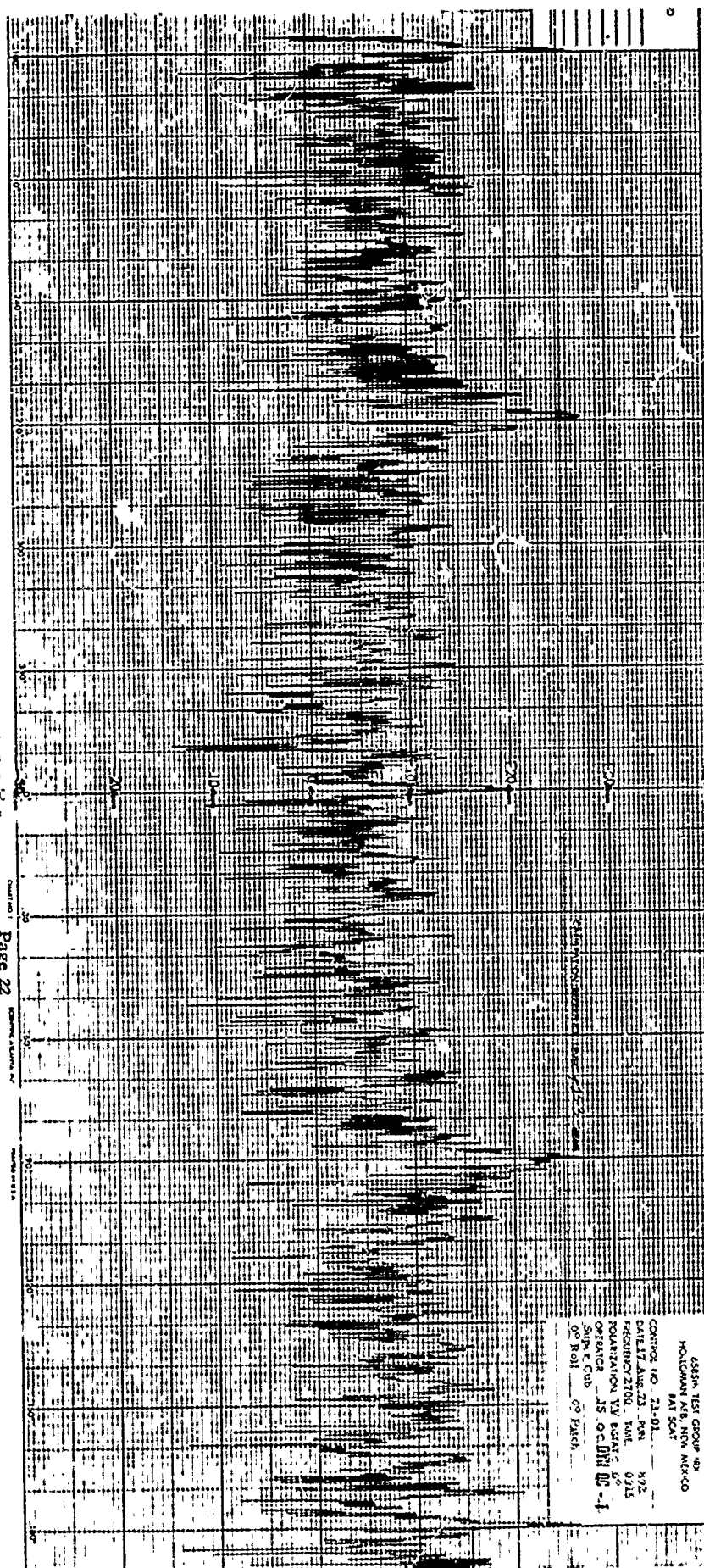

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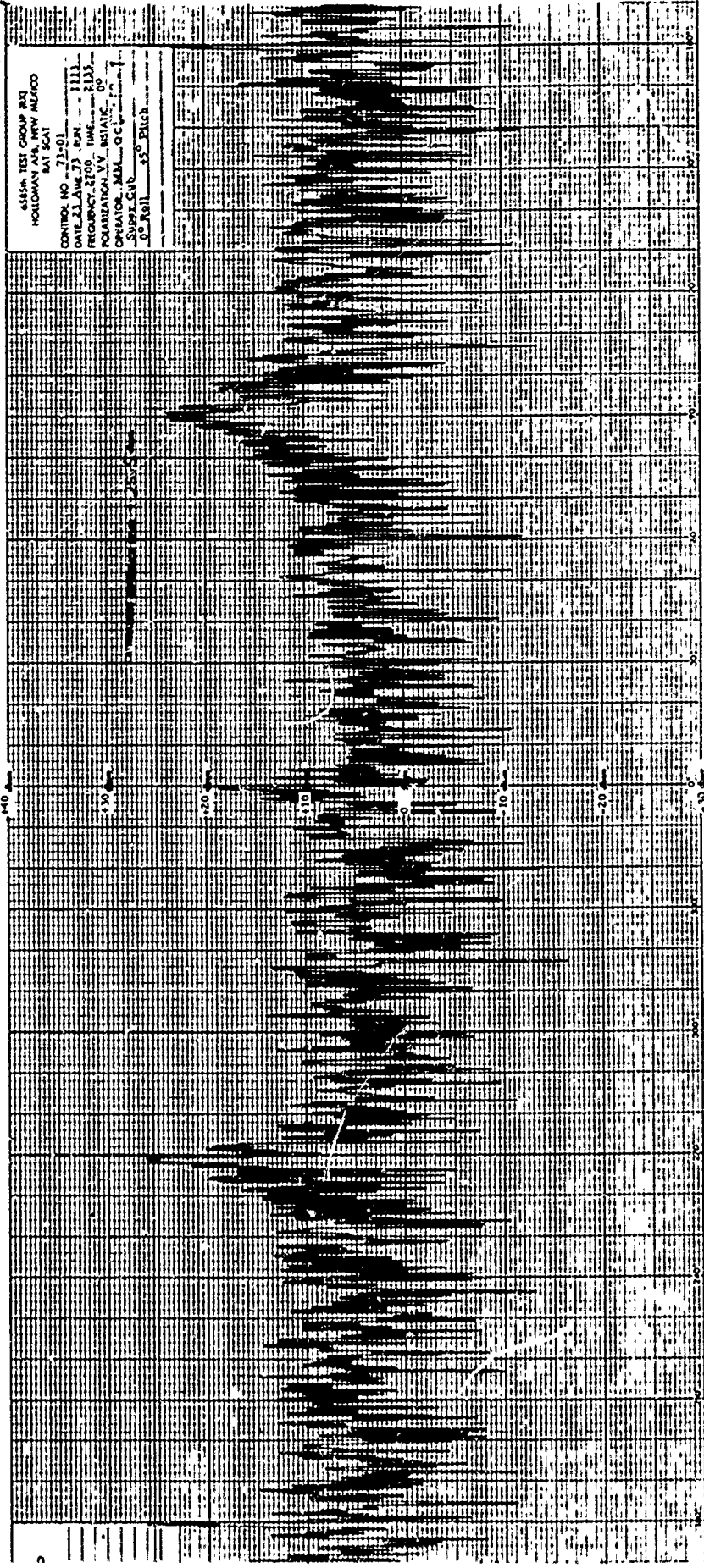
638th TEST GAC-P 101
HOLCOMB AFB, ARK, ARKCO
AT 1001
CONTROL NO. 73-01 1023
DATE 22 AUG 75 RSN 1023
FREQUENCY 2700 1002 1000
FOURTH/ARWY 83-74 C
OPERATOR NIM OC DM 10-1
SUPERVISOR
of Roll, -10° Pitch



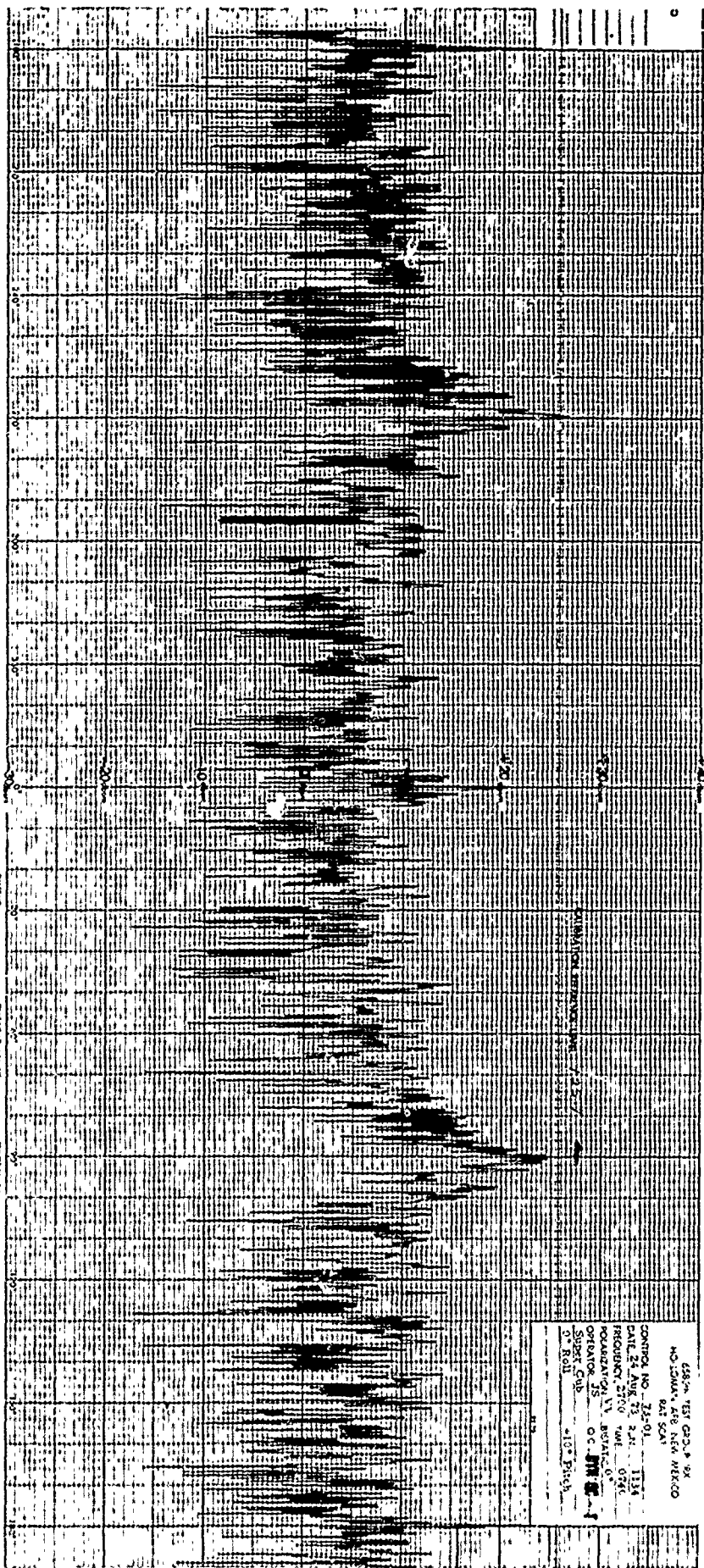
ASPHIN TEST GROUP (B7)
HOLLOMAN AFB, NEW MEXICO
PAT SCAT
CONTROL NO. 73-01
DATE 22 AUG 73 RWL 1035
FREQUENCY 2700 TIME 1835
POLARIZATION VV - STATIC 0°
OPERATOR MIA OC DYN 00-1
SUPP Cab
0° Roll -50 Elst



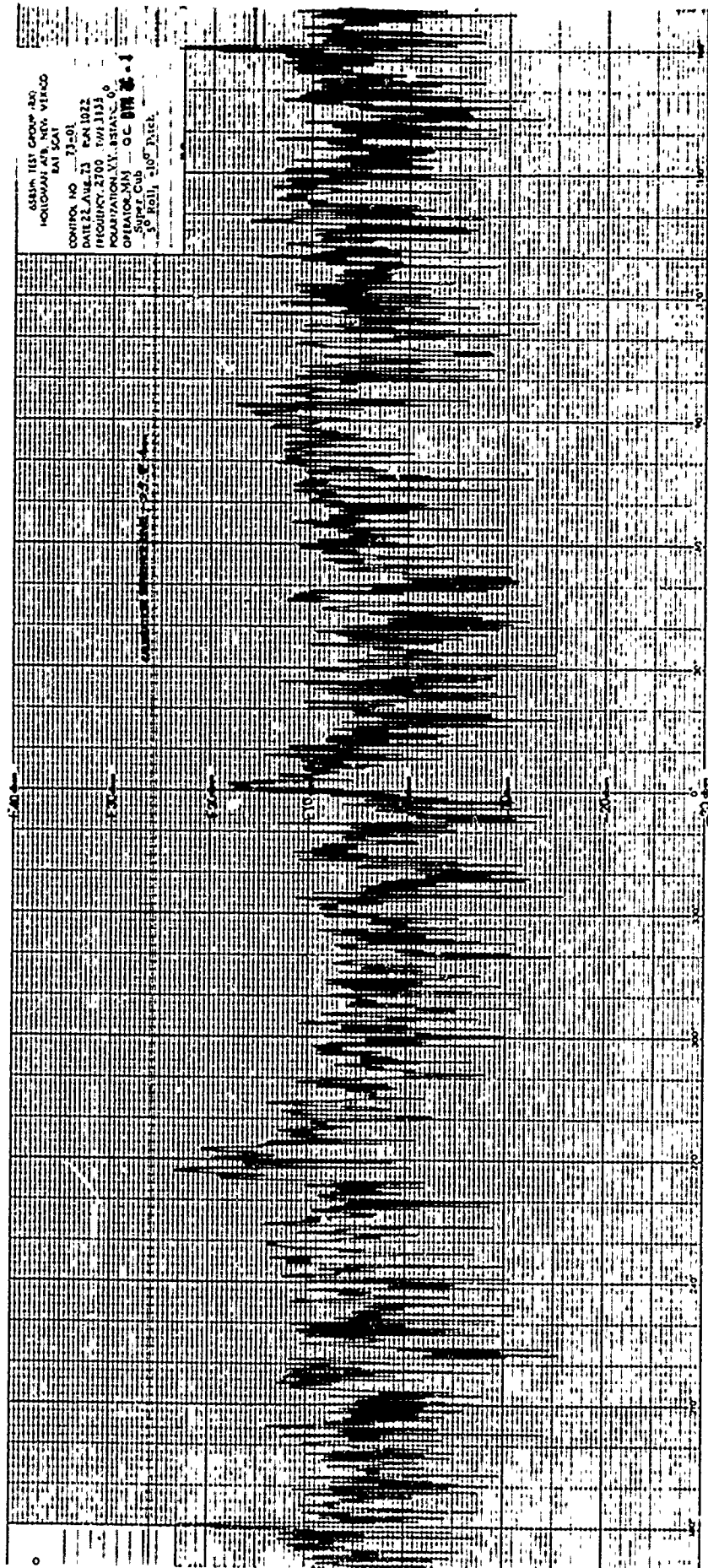
658th TEST GROUP - 12X
HOLLOMAN AFB, NEW MEXICO
PAT SCAT
CONTROL NO. 21-01
DATE 17 AUG 73 - 800 802
FREQUENCY 2700 - 1000 0315
POLARIZATION VY B3A1C 00
OPERATOR JS OC DM DC -1
Supr E Cub
00 Roll 00 Patch

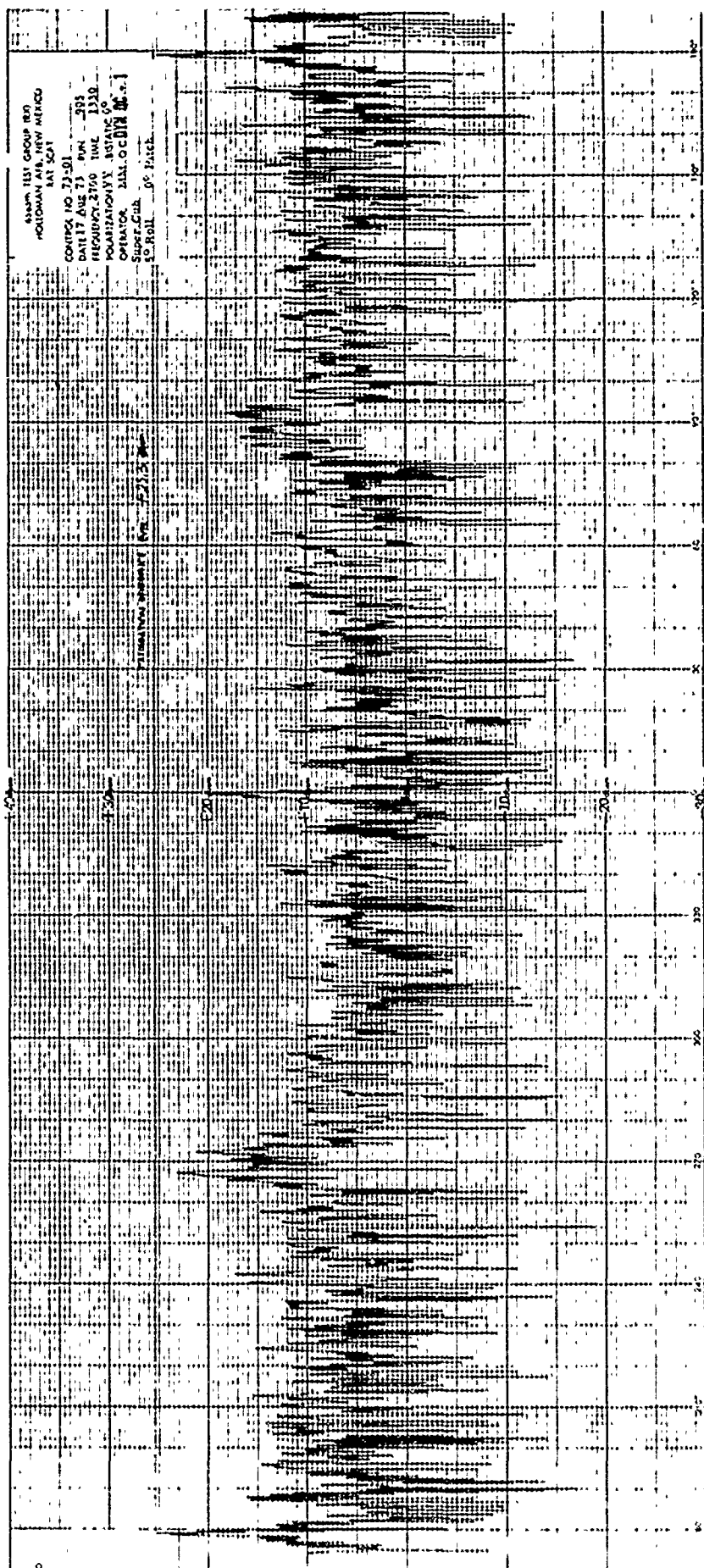


ASIAN TEST GROUP 8X1
NOTATION: 1000 1000 1000
CONTROL NO. 73-01
DATE: 11/11/73
FREQUENCY: 100
POSITION: 100
OPERATOR: 100
SUBJECT: 100

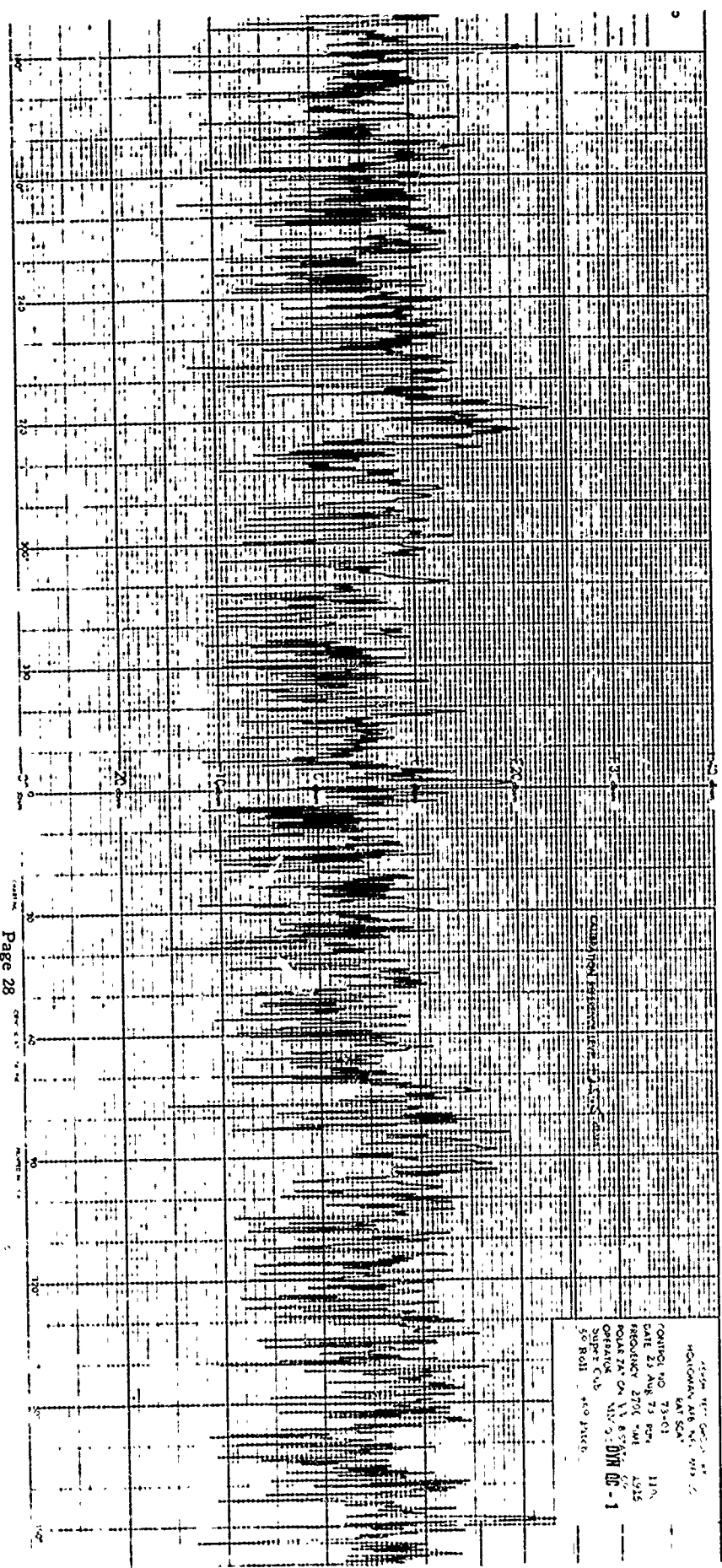


ASSIN TEST GROUP 120
HOLCOMB AFB, NEW MEXICO
EAT SCAT
CONTROL NO. 73-01
DATE 22 JUL 73 P-411022
FREQUENCY 2700 100 1113
OPERATOR MM OC 0100
SUPER Cub OC 0100
10 Roll, 100° Pitch





ASAP 1ST GROUP RD
HOLDMAN AFB, NEW MEXICO
LAT 34N
CONTRACT NO. 23-01
DATE 17 AUG 73 RUN 393
REQUIRE 2700 TIME 1330
POSITIONALITY DISTANCE 0
OFFICE MAIL ROOM 00-1
SPECIAL 00-1
TO RAIL 00-1



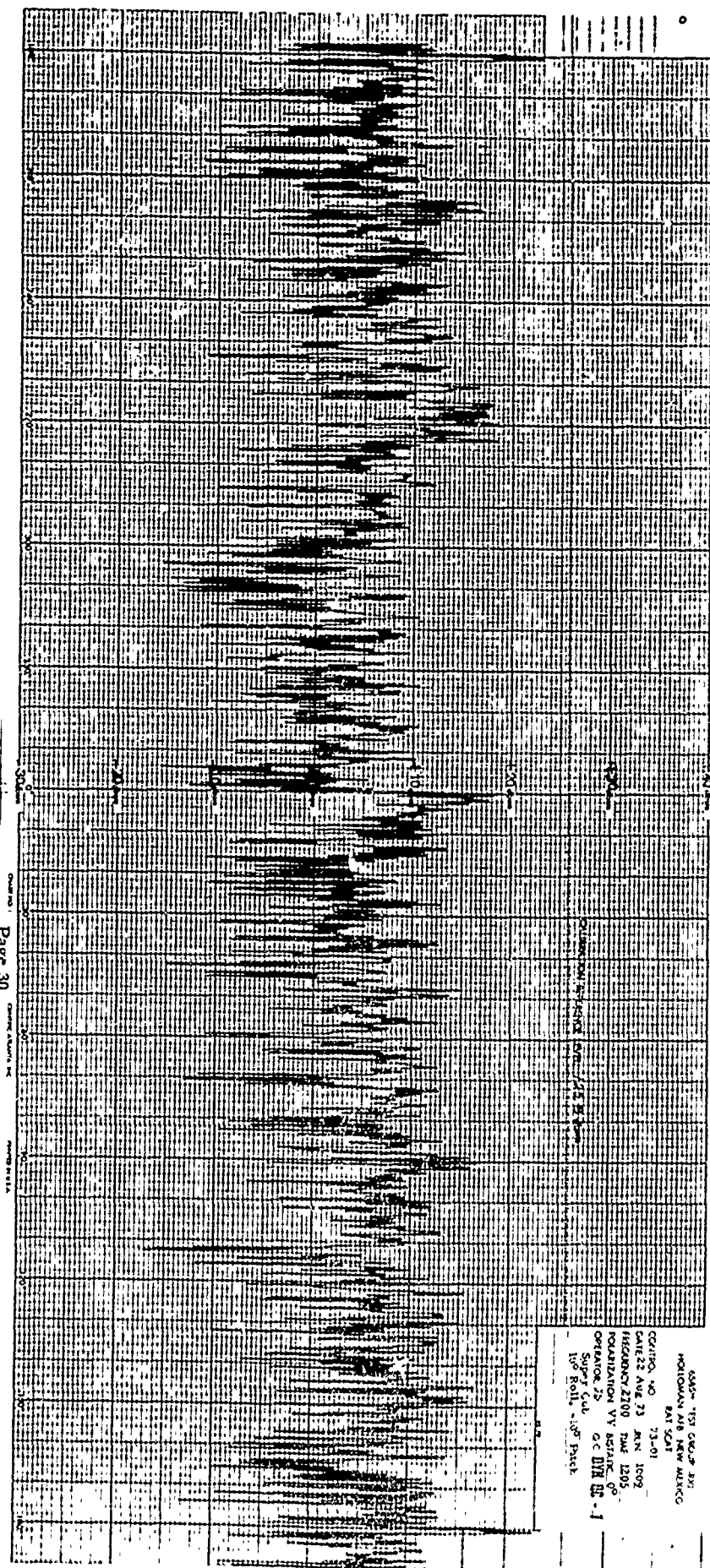
15000 Hz
HOLCOMB AFB TX, 710 10
LAT 34N
LONG 101 15W
DATE 23 AUG 73
FREQUENCY 2700 MHz
MODEM 2K ON 11.8 KHz
OFFLINE CUB
50 Rdbt 450 PACE
DYN DC - 1

0315H TEST GROUP OF
HAWAIIAN AIR NEW MEXICO
PAT SCAT

CONTROL NO 73-01 1135
DATE 24 AUG 73 RNN
FREQUENCY 2700 TIME 0810
POSITIONATION VY 8314C-0
OPERATOR JS OC DVM 80-1
SUPER Cub
5° Roll 110° Pitch

0315H TEST GROUP OF
HAWAIIAN AIR NEW MEXICO
PAT SCAT

CONTROL NO 73-01 1135
DATE 24 AUG 73 RNN
FREQUENCY 2700 TIME 0810
POSITIONATION VY 8314C-0
OPERATOR JS OC DVM 80-1
SUPER Cub
5° Roll 110° Pitch



6540- TEST GROUP 3X1
HOLLOMAN AFB NEW MEXICO
BAT SCAT
CONTINO. NO 73-01
DATE 22 AUG 73 RUN 1002
FREQUENCY 2100 PWT 1205
POLARIZATION VY BEARING 00
OPERATOR JS CC DTH EP -1
Super Cat
100 Roll - 100 Patch

6585M TEST GROUP 18A1
MOLITION ATB NEW MEANS

63835 151 GROUP (RA)
MOLLOMAN A18 NEW MEATS

WEST GARDEN
ATLANTA, GA 30328

73-01

2. 2014

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of the
of the

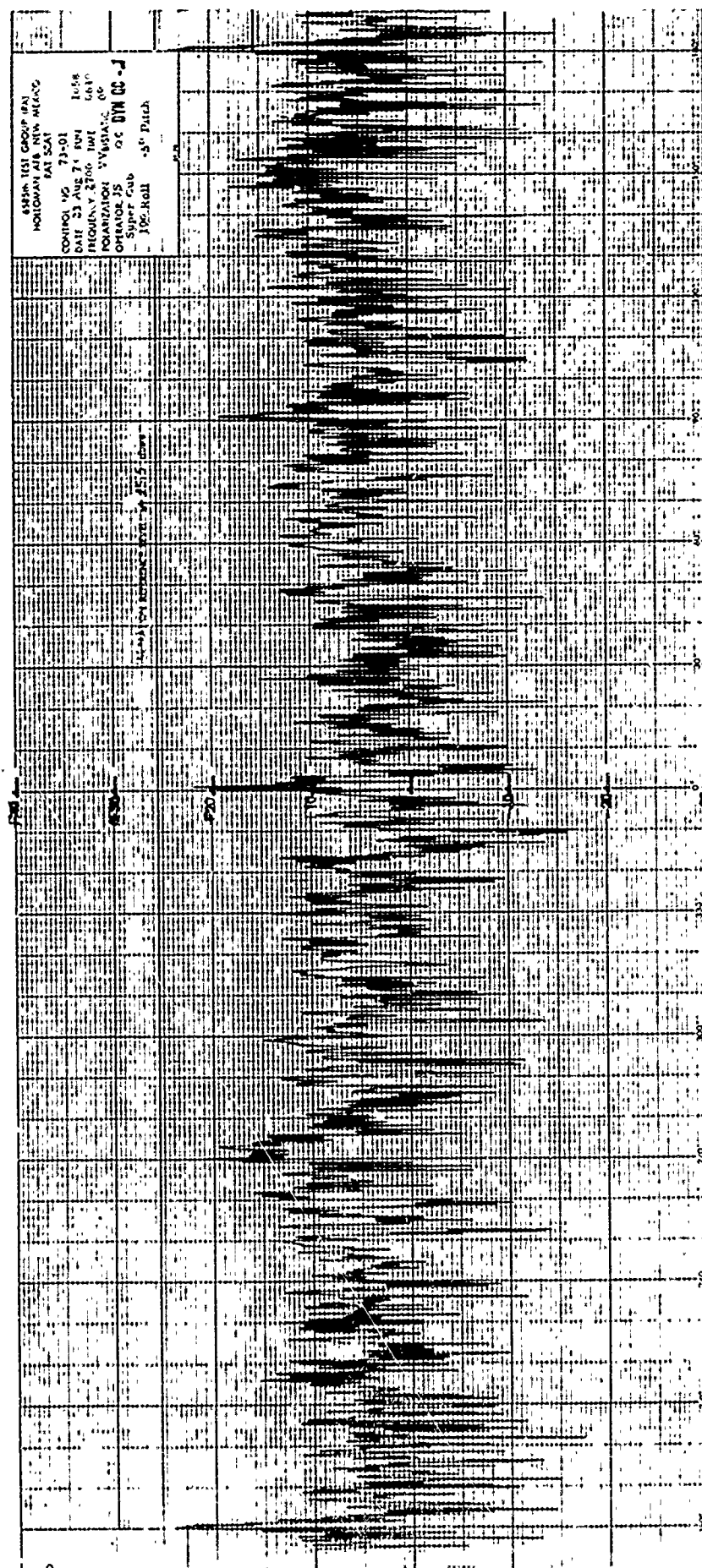
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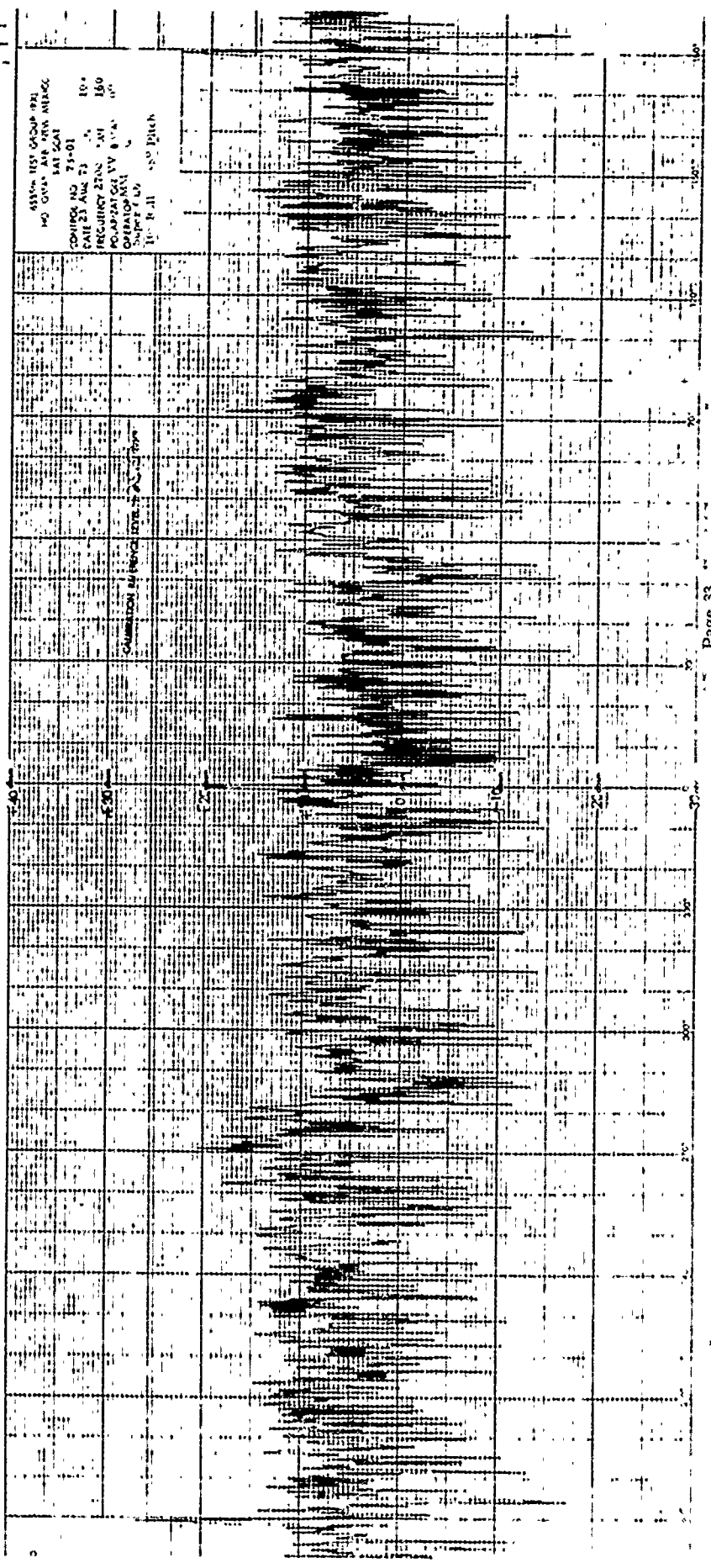
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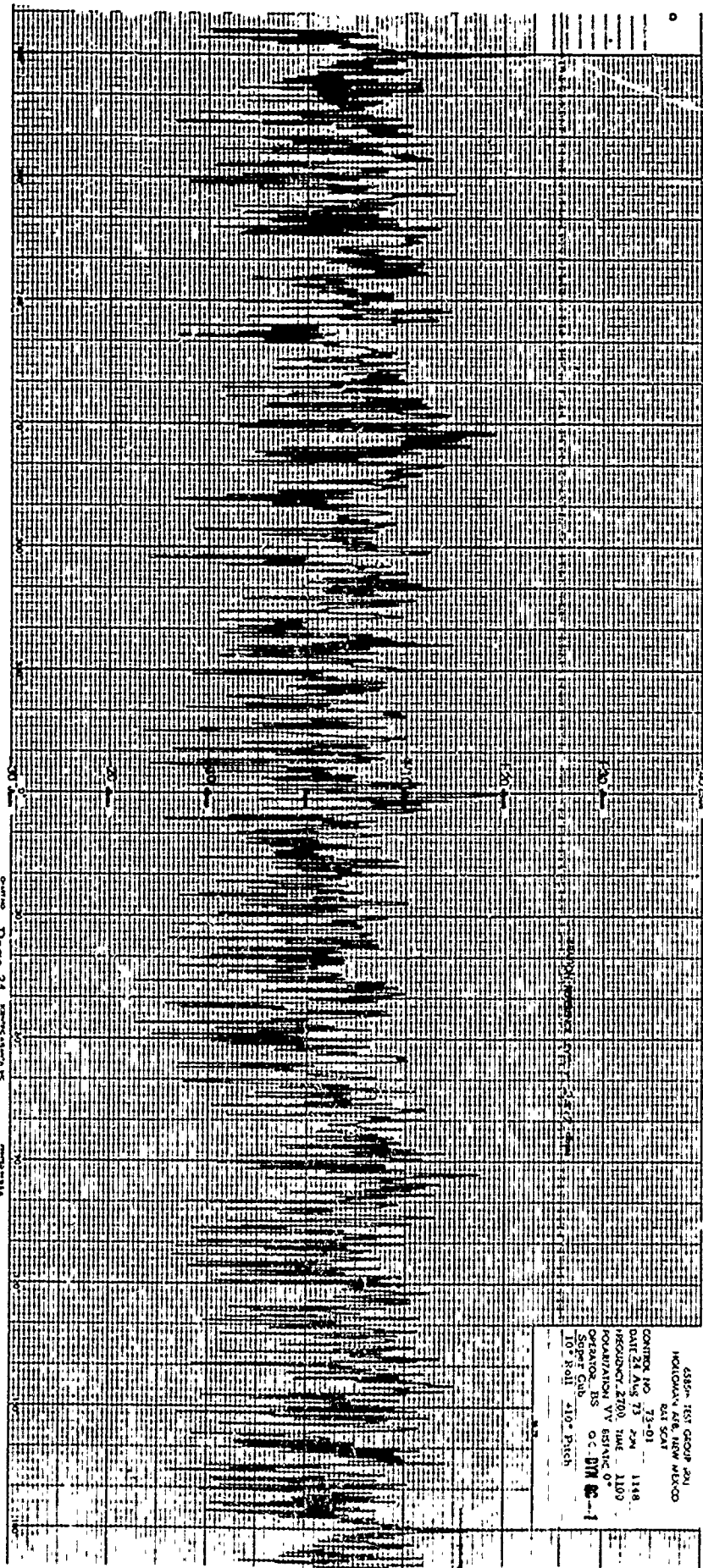
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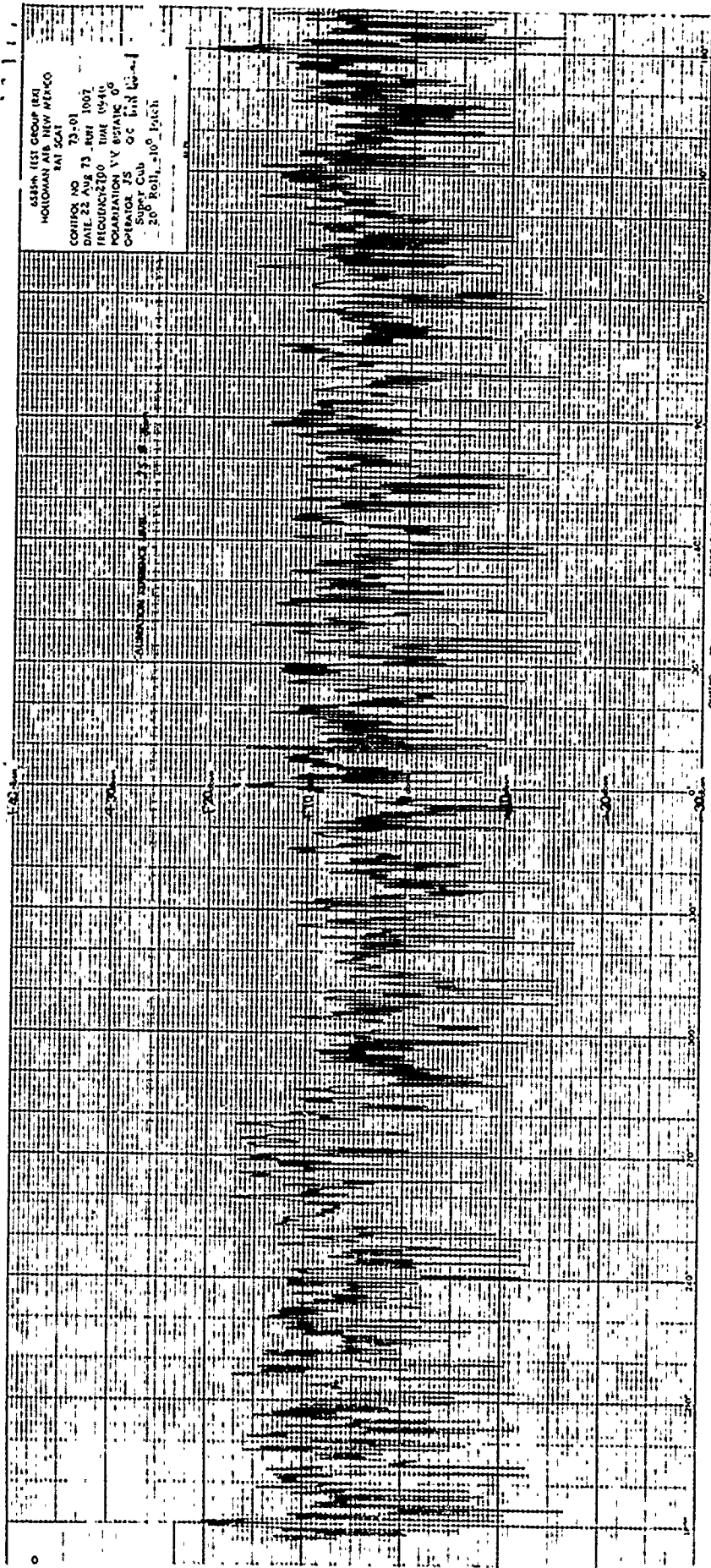


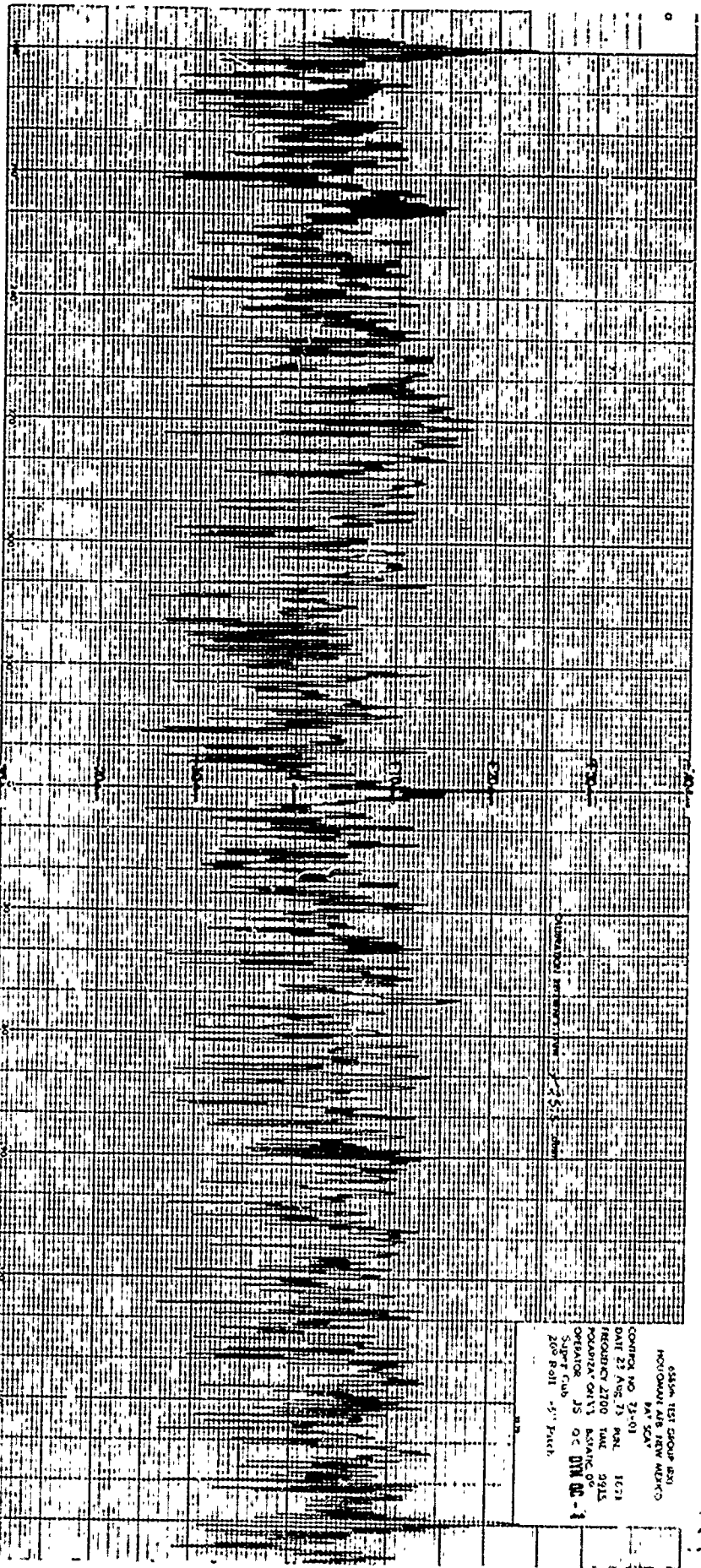




435th TST GROUP 241
HOLCOMB AFB, NEW MEXICO
S&T SCAT
CONTING NO. 73-01
DATE 24 AUG 73 TIME 1148
FREQUENCY 2700 HZ
POLARIZATION VV BEARING 0°
OPERATOR HS OC DM 8-1
Super Gnb
10° Roll 410° Pitch

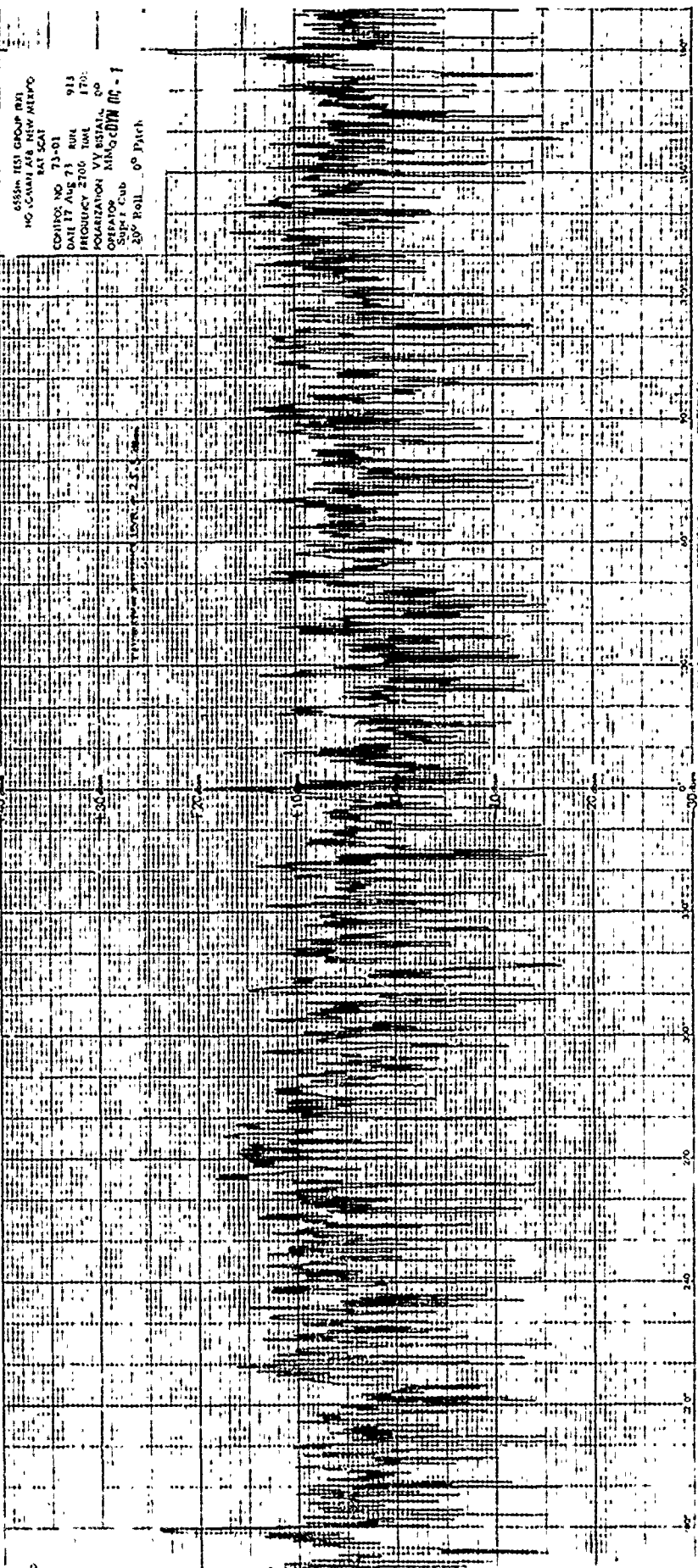
638th TEST GROUP (BT)
 HOLLOMAN AIRB. NEW MEXICO
 EAT SCAT
 CONTROL NO 73-01
 DATE 22 AUG 73 RWY 1007
 FREQUENCY 2100 TIME 0940
 POLARIZATION VV BISTATIC 0°
 OPERATOR JS GC 1111 638-4
 Super Cub
 20° Roll, 10° Pitch

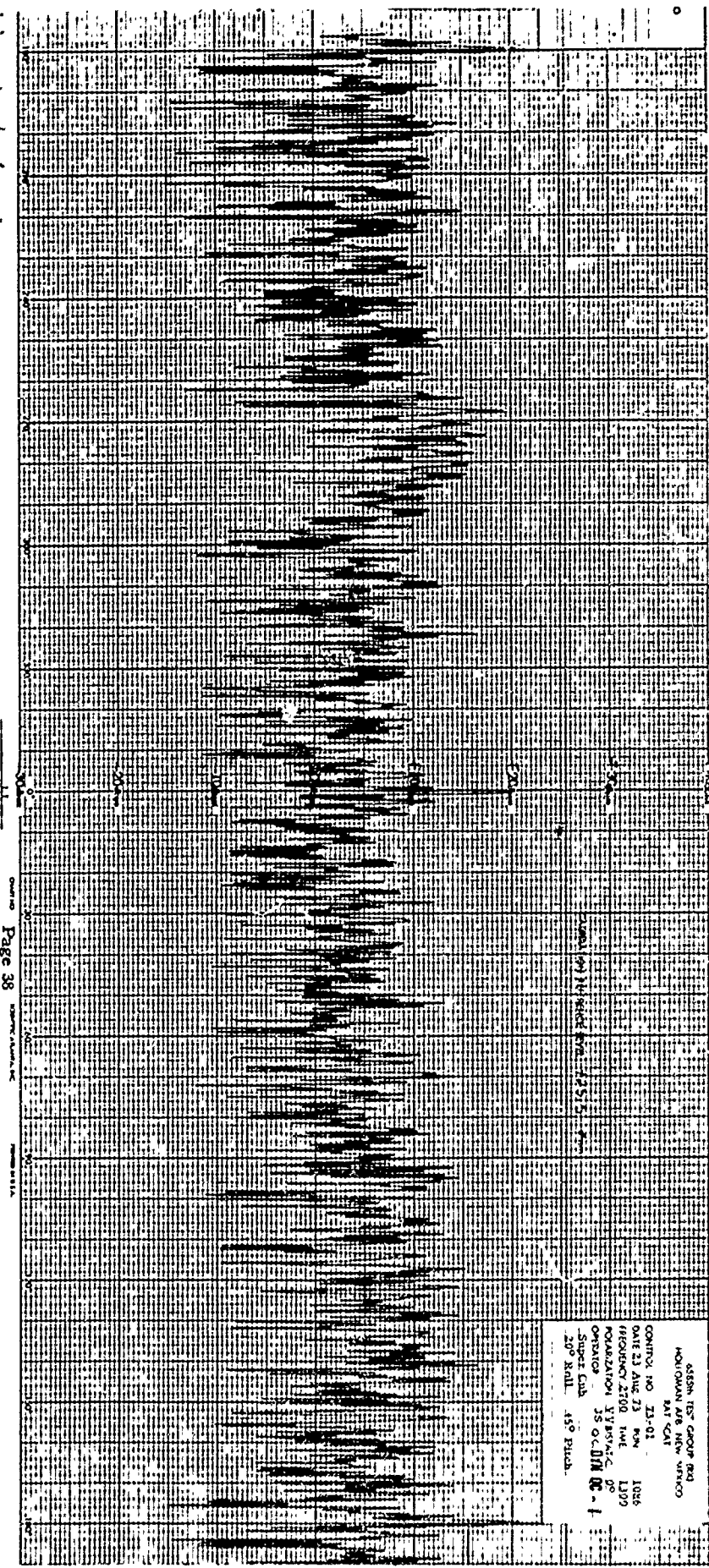




6350N TEST GROUP 801
HONOLULU AIR NEW MEXICO
BA 504
CONTROL NO 33-01
DATE 23 AUG 75 PAGE 1671
FREQUENCY 2700 TONE 9915
POLARITY ONLY BOUND OF
OPERATOR JS OC DTN 02-1
SUPER Club
200 Roll -5" Patch

555th IES GROUP RHT
NO 10141141
MAT SCAT
CONTROL NO. 73-01
DATE 17 AUG 73 RHT 911
FREQUENCY 2706 RHT 170
ORGANIZATION VY 8000
OPERATOR MIN GORDON
Super Cub
20° Roll 0° Pitch





ASSON TEST GROUP RD
HOLLOMAN AFB NEW MEXICO
BAT CAT
CONTROL NO 23-01
DATE 23 AUG 73 RM 1046
FREQUENCY 2500 HZ 1309
MODULATION VV 874.6 90
Oscillator 35 0.01M 90-1
Super Cat 450 Push.
200 RLL

553A (SI) GROUP (SI)
HIGHTMAN AIR WING
FALCON

CONTROL NO 73-01

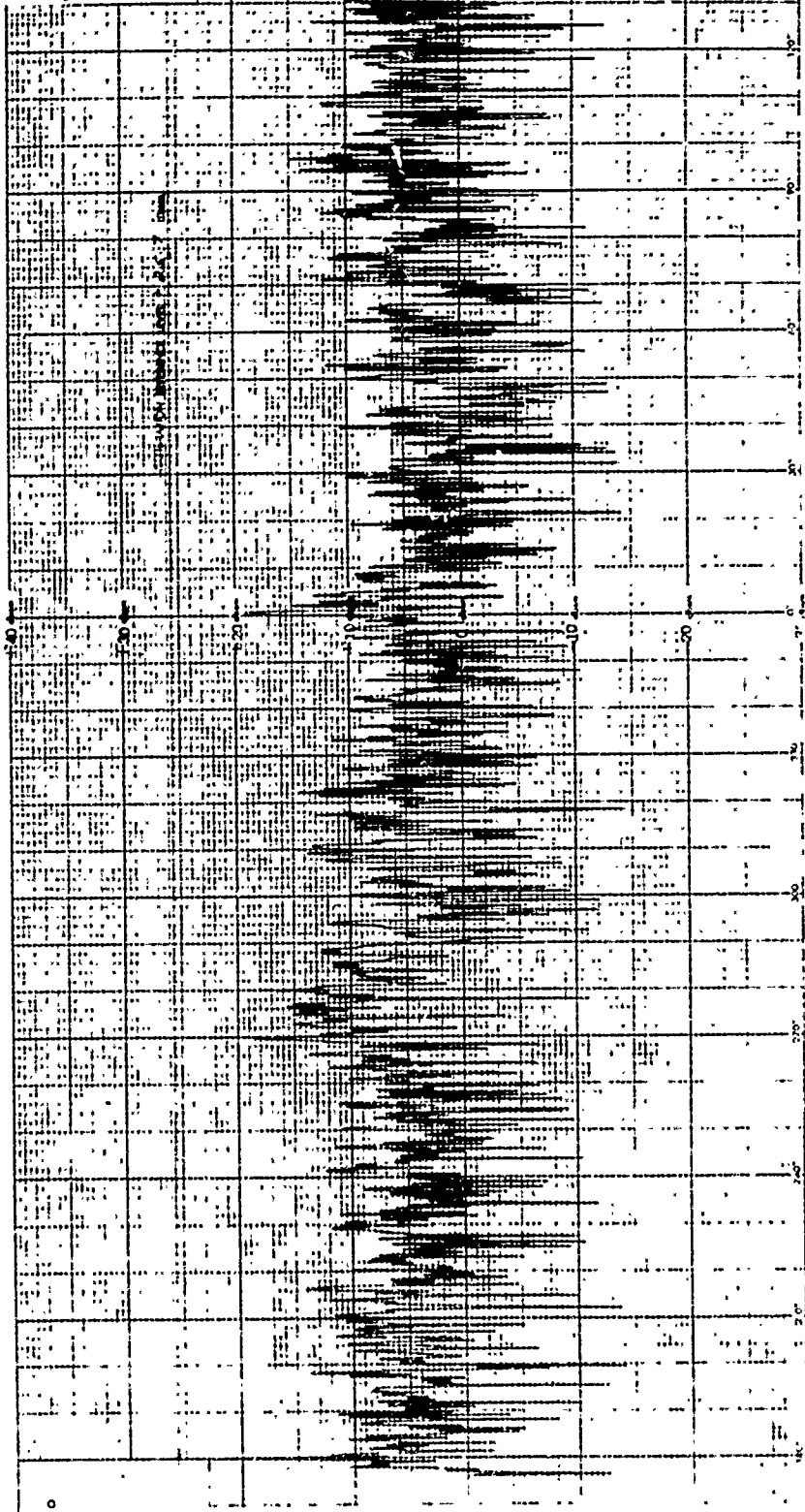
DATE 21 AUG 73 AIR 1110

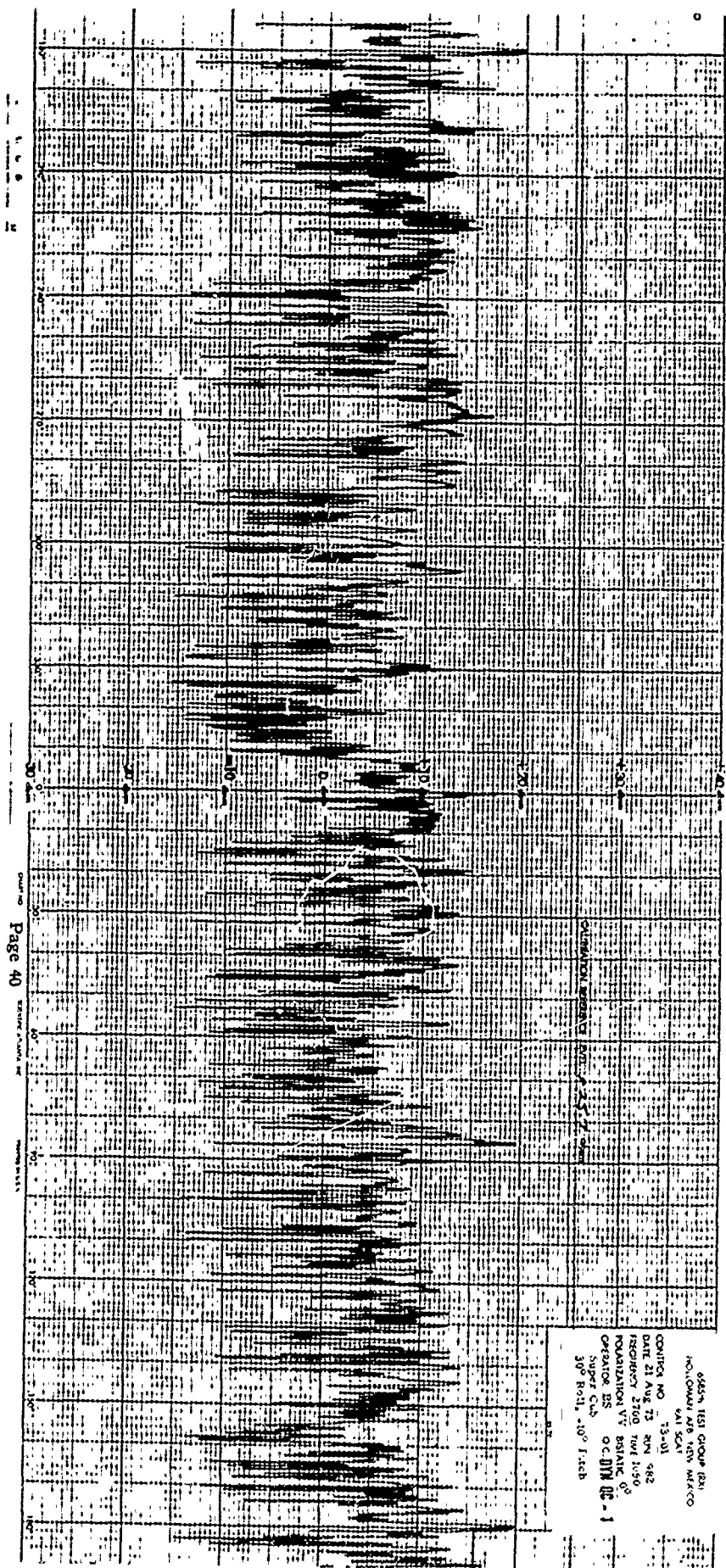
REQUENCY 2100 MHz

POLARIZATION 11 BEAM

ORBITAL 75 OC DTR 8C - 1

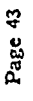
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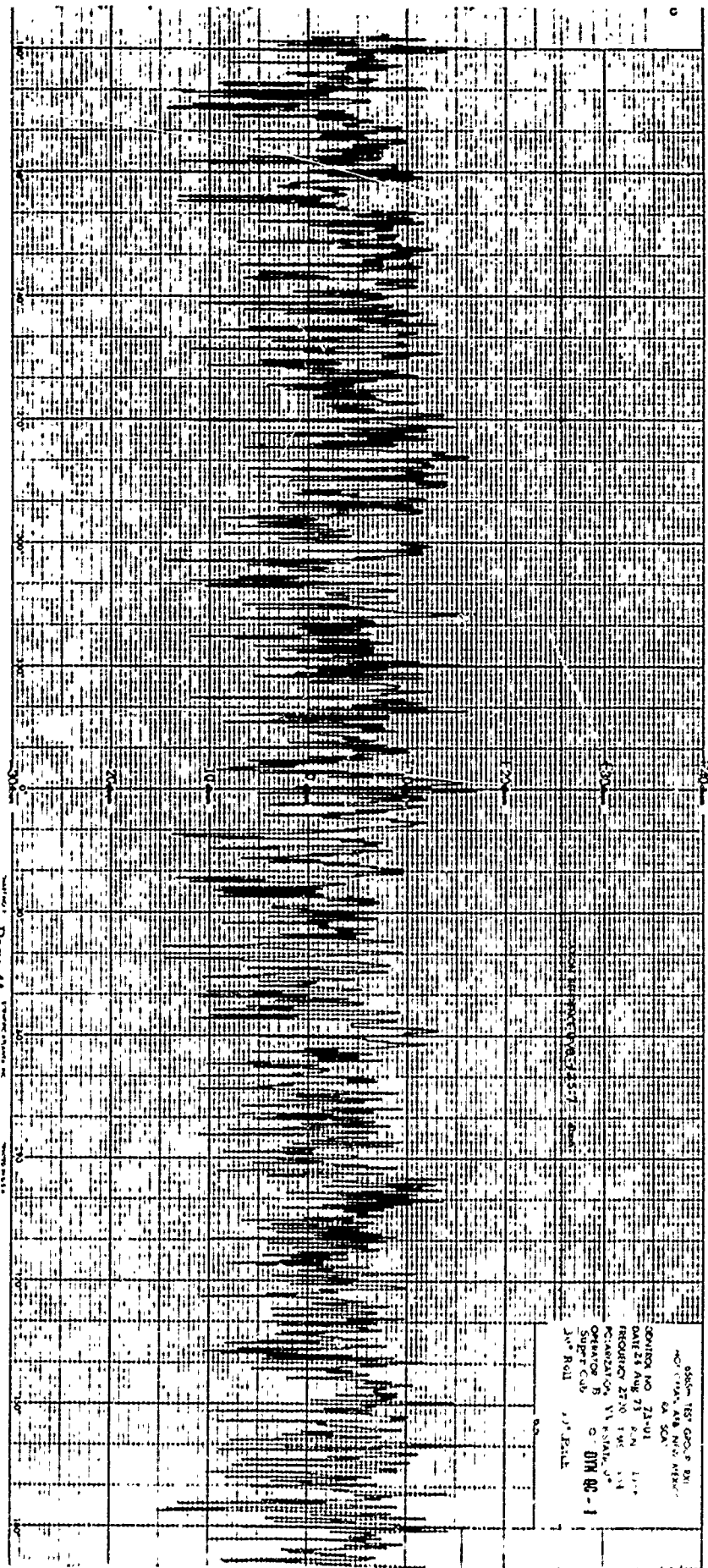




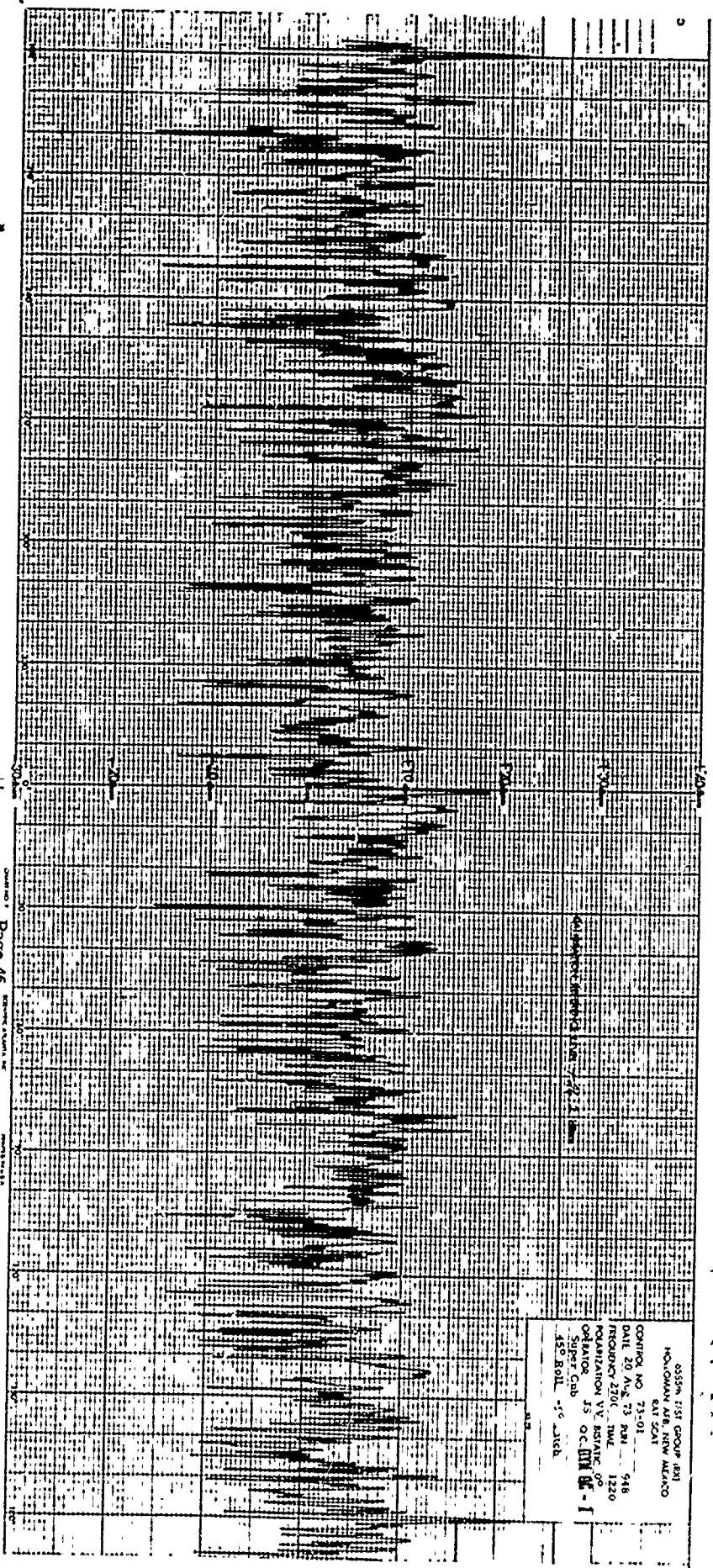
6455N TEST GROUP (2N)
HOLLOMAN AFB NEW MEXICO
641 SCAT
CONTING NO 13-01
DATE 21 AUG 73 RUN 982
FREQUENCY 2700 TWT 1:50
POWIALIZATION VV BISTATIC OF
OPERATOR BS O.C. DIM 12-1
SUPER CUB
30° Roll, 10° Pitch

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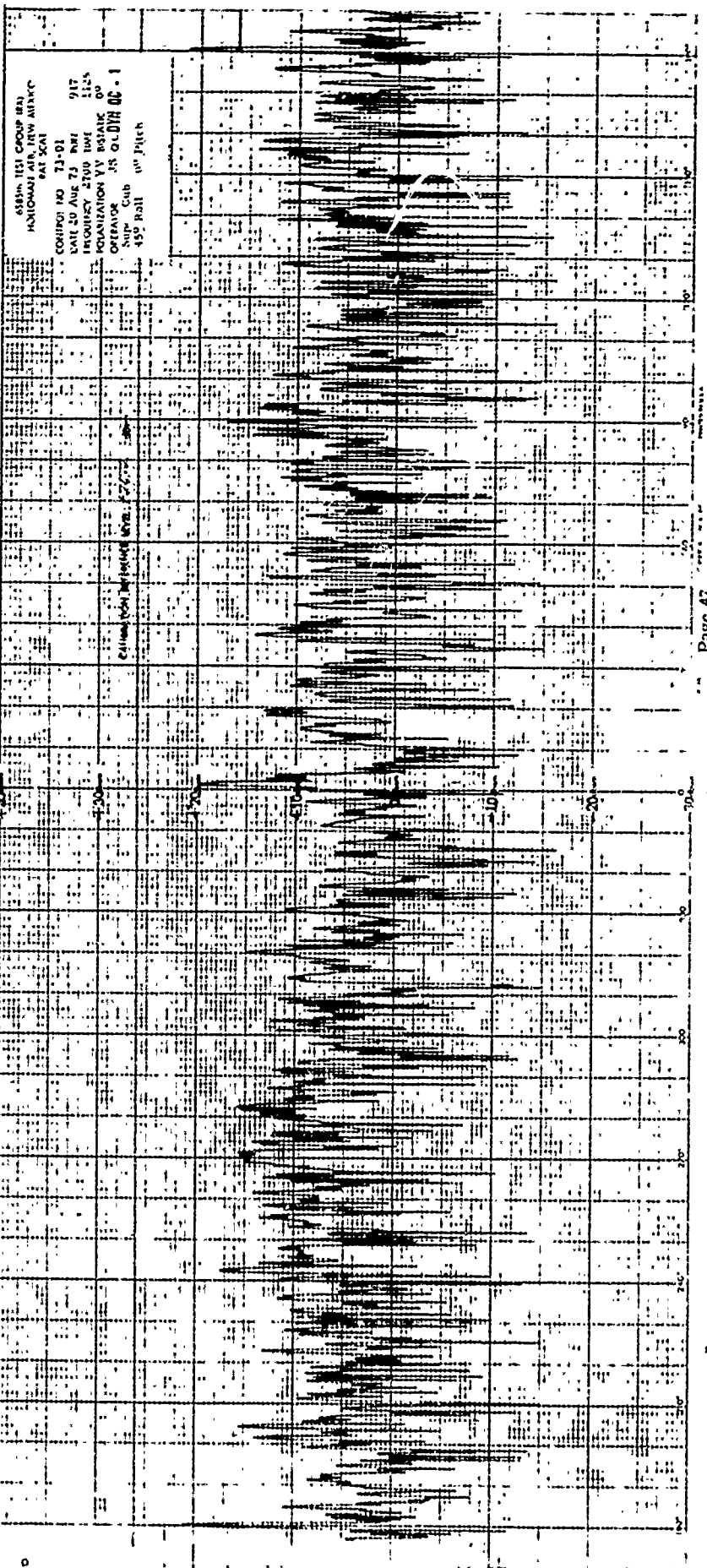


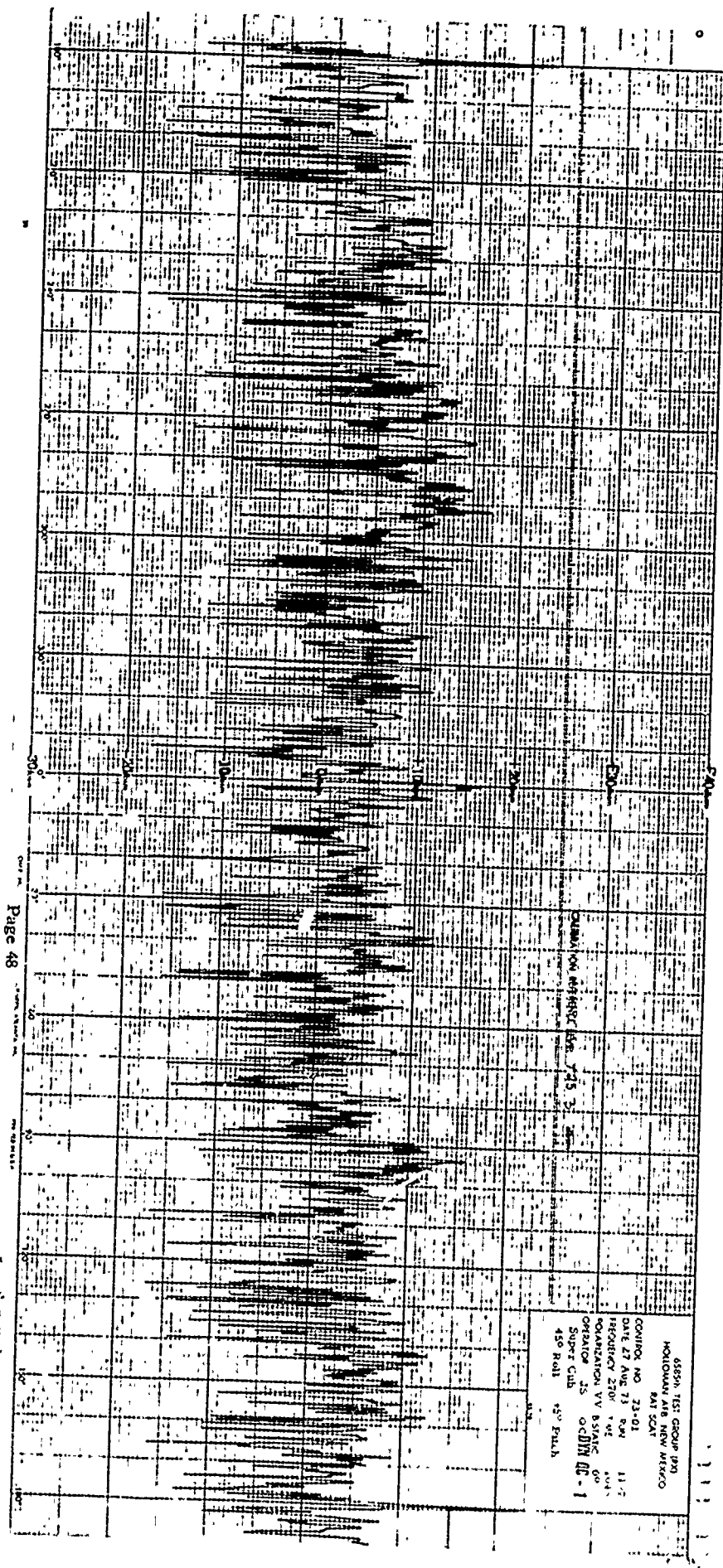


SECTION 100 GPO, P. 201
 NO. 100 GPO, P. 201
 DATE: Aug 7, 1961
 RECORDING 2710 100
 OPERATOR: V. K. K. K.
 SUPERVISOR: B. O. O. O.
 JUL 20 1961



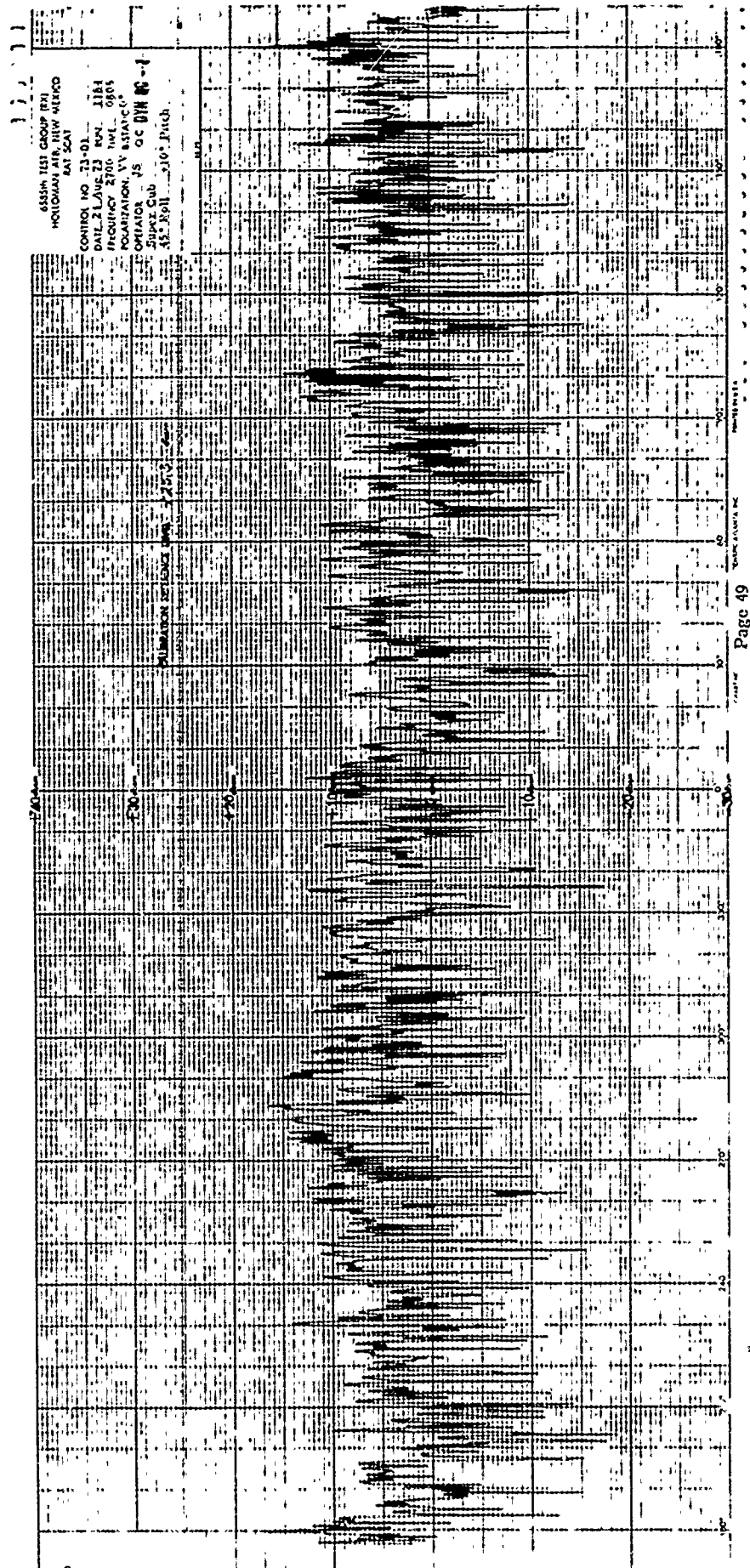
5555N 151E GROUP 80N
HOLCOMB AIR NEW MEXICO
LAT 3241
CONTROL NO 73-01
DATE 20 AUG 73 PM 548
FREQUENCY 270C TIME 1220
POLARIZATION VY BEARING 00
OPERATOR JS OC 0118 BT - 1
450 BOLL - 56 Jitch

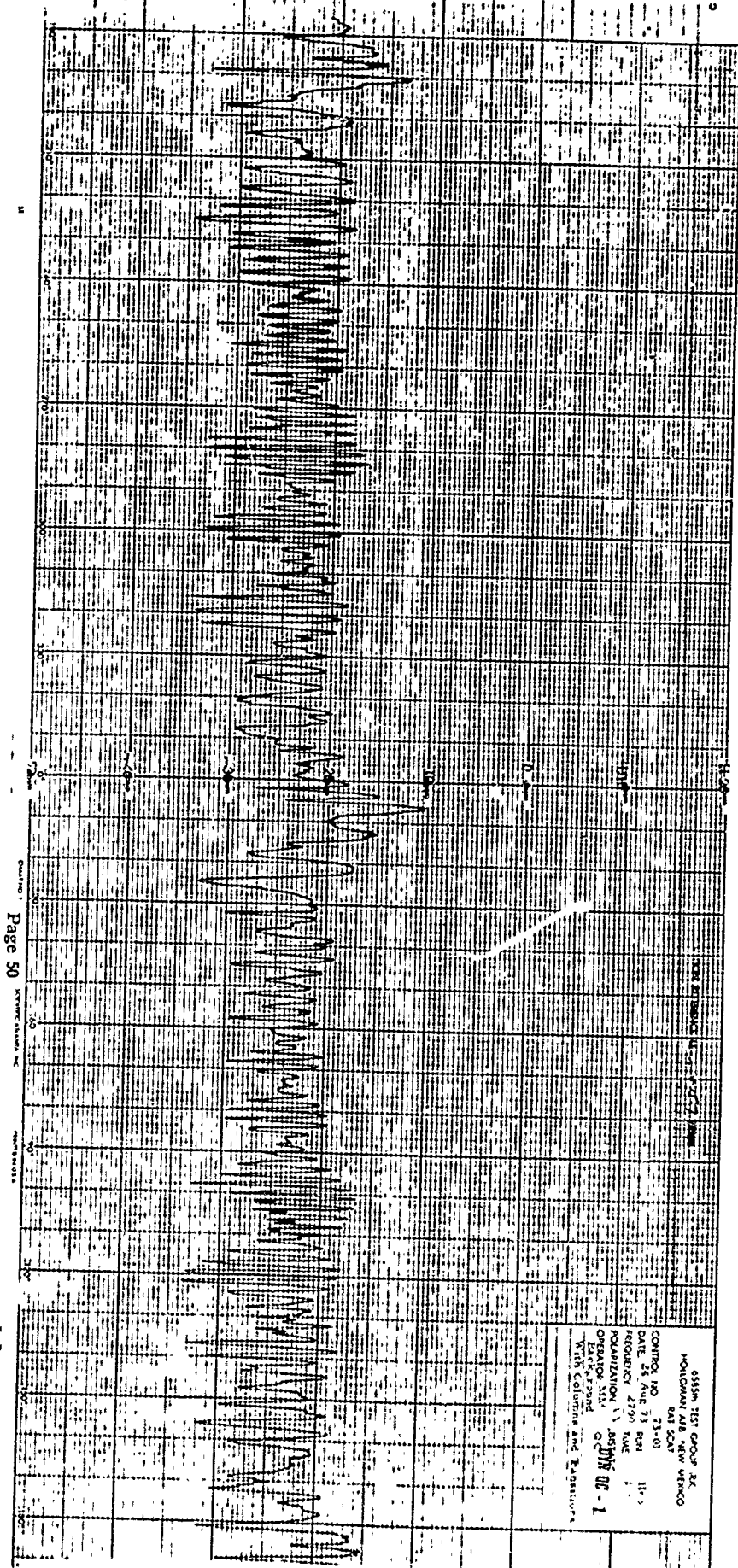




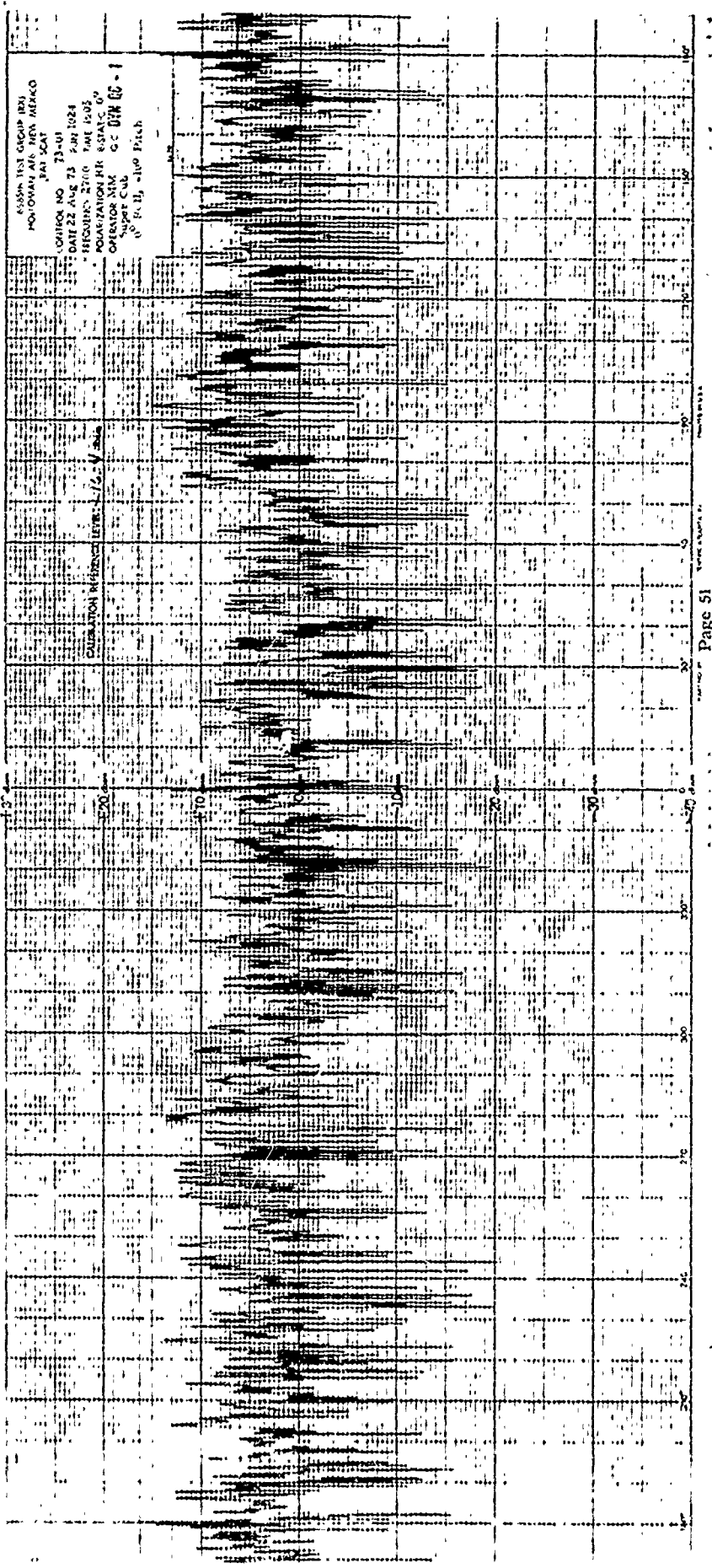
Page 48

6825N TEST GROUP 100
 HONOLULU AFB NEW MEXICO
 RAI 504
 CONTROL NO 73-01
 DATE 27 AUG 73 RAN 11-7
 FREQUENCY 2700 V 02
 MODIFICATION VV B5141C
 OPERATOR JS OODM GC-1
 SUPER CLUB
 450 RAIL 450 PULS





0355m TEST GROUP 3X
HOLCOMAN AFB, NEW MEXICO
BAI SCAT
CONTROL NO. 23-01
DATE 24 Aug 73 PM 11:2
FREQUENCY 2750 KHz
POLARIZATION \ \ JSCN 00-1
OPERATOR MVA
Back found
With Columns and Expositions



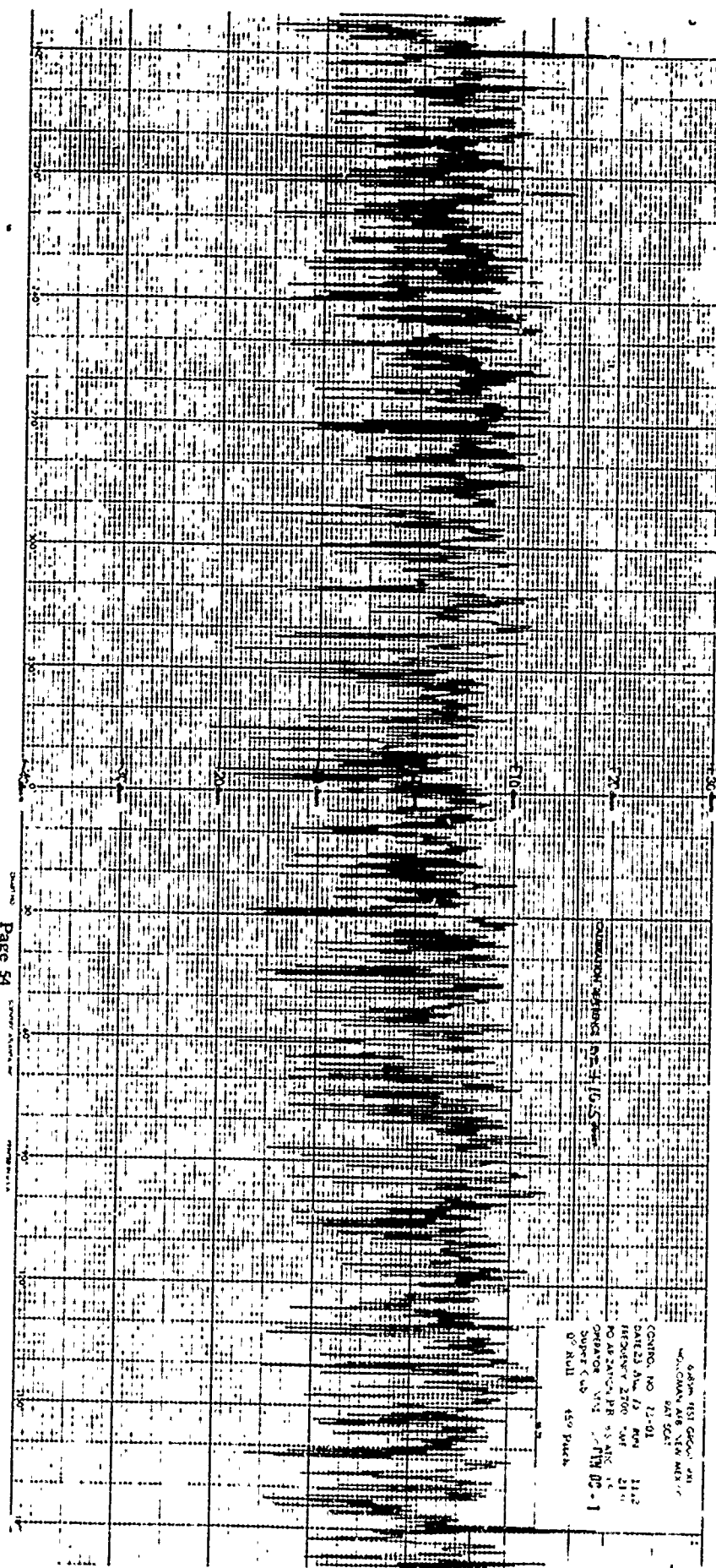
654-114, 1140 J BR
HOLLOMAN AFB NEW MEX
BAY SCAT
CONTRACT NO 73-02
DATE 22 AUG 73 EQA 1036
REC'D 270 141 1950
ROADZATC BR 6 141 10
CERFAC 141
Supper Club
100 Poll
Pitt.

689m 1ST GROUP [R]
MOLMAN AIR NEW MEXICO
SAT SAT

CORPUS NO 73-01 - 893
DATE 17 AUG 73 FOR TIME 0730
REGISTRATION R/R PLANE OF
OPERATIONS 75 OCT OH QG - I
OF THE CLUB
DO NOT
DO FILE

PENALTY APPROX \$100 / DAY
\$100 / DAY

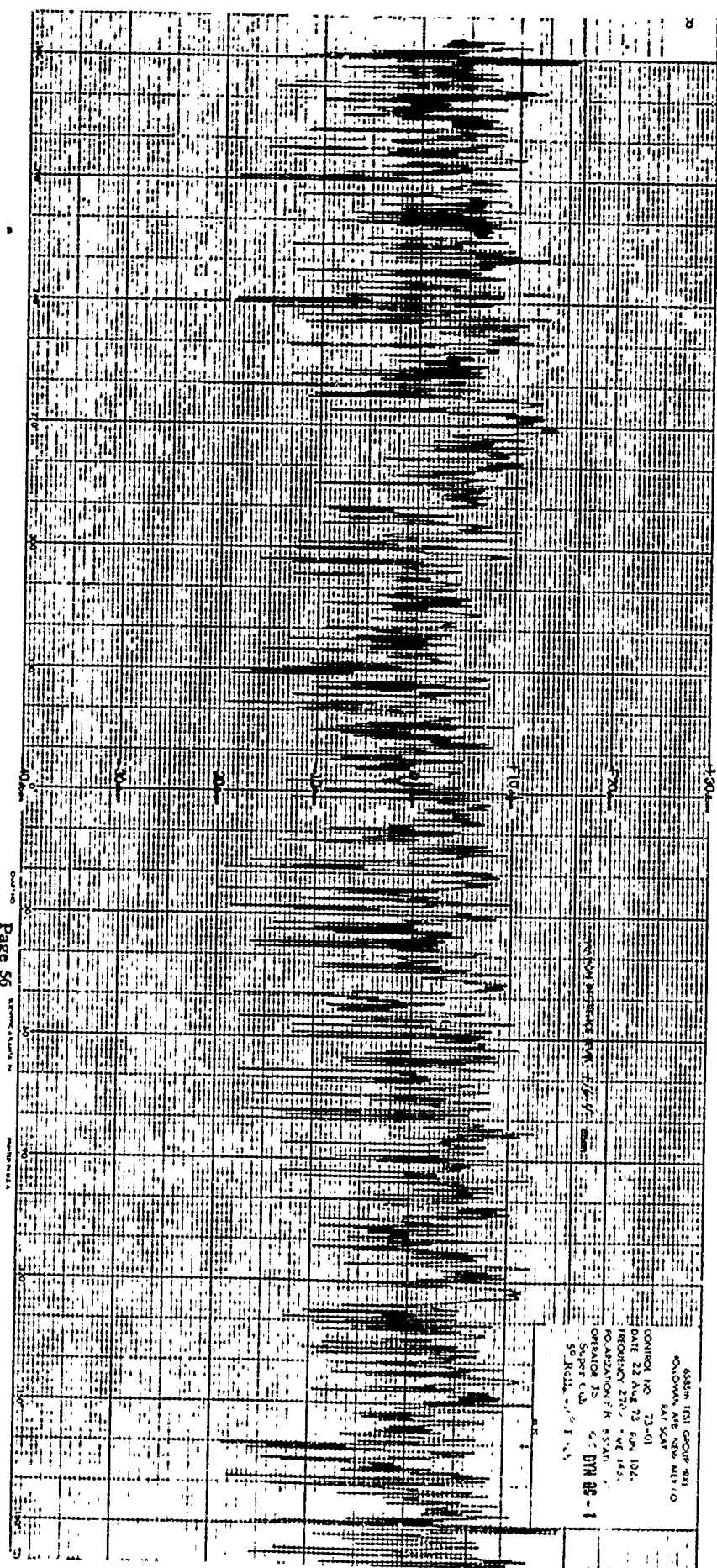
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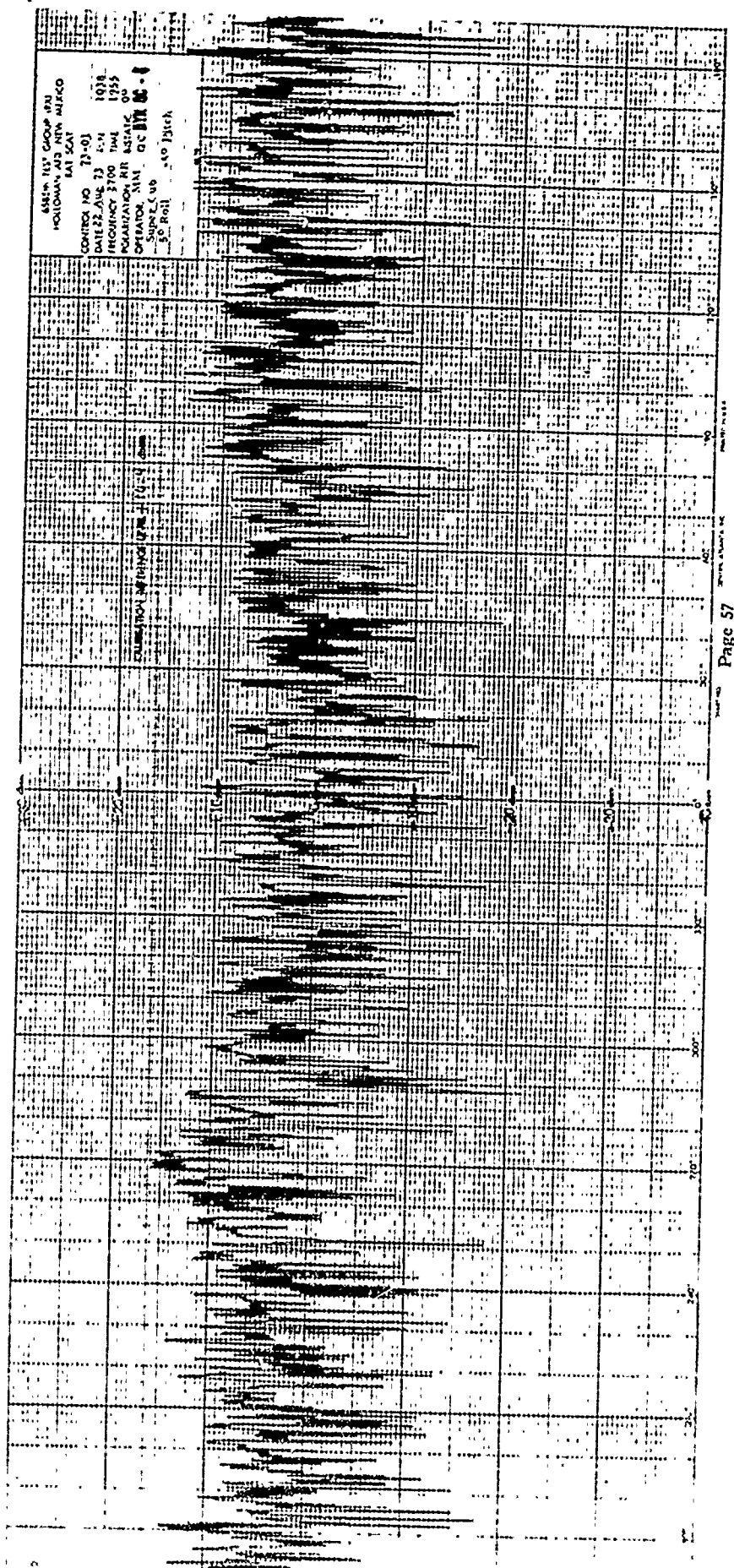


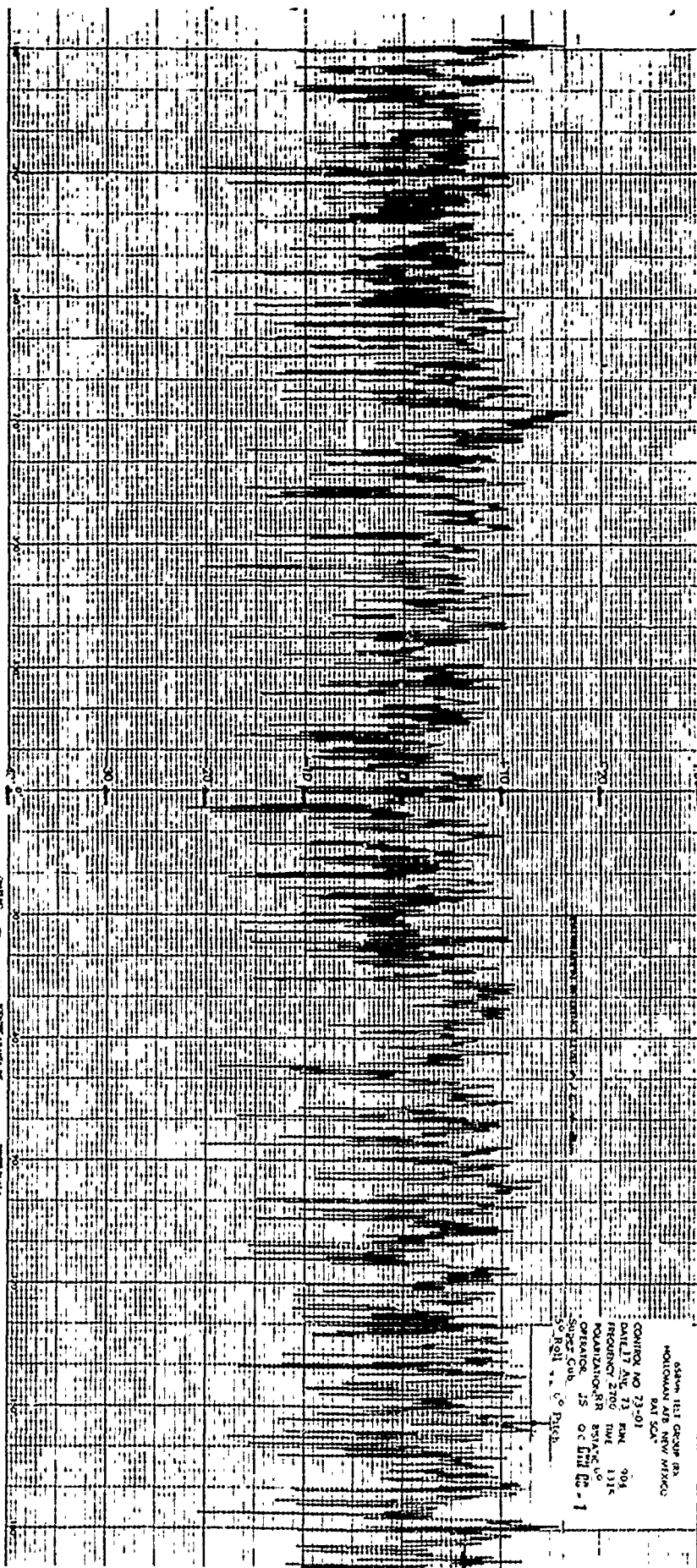
GREEN TEST GROUP (X)
HOTOMAR, AVE. NEW MEXICO
SAT SAT

CONTROL NO 71-01
DATE 24 AUG 73 PUN. 1133
FREQUENCY 2100 MHz 0110
POLARIZATION RH BRITANCO
OPERATOR JS GC 0110 8-1
Superf. Lab
0° Roll 110° Pitch

0 10 20 30 40 50 60 70 80 90 100

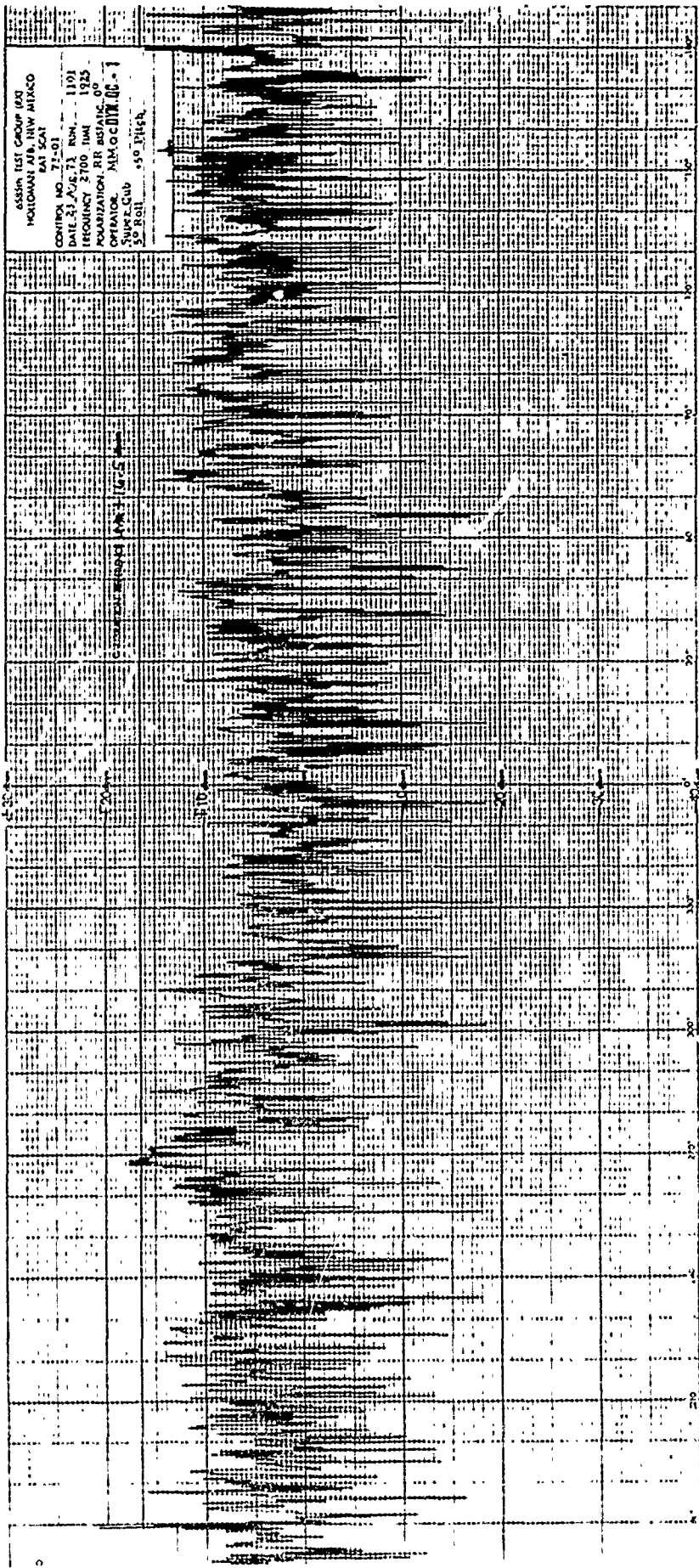


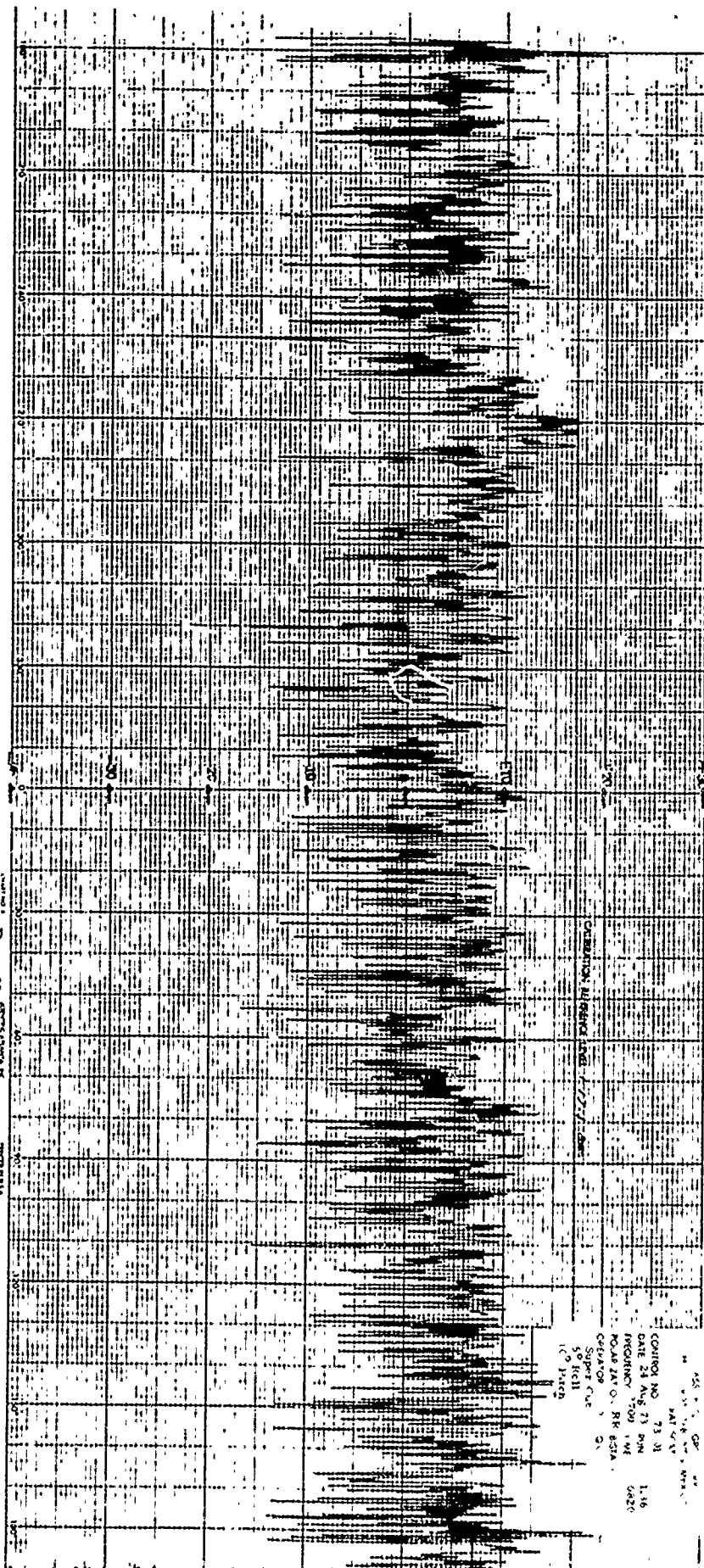




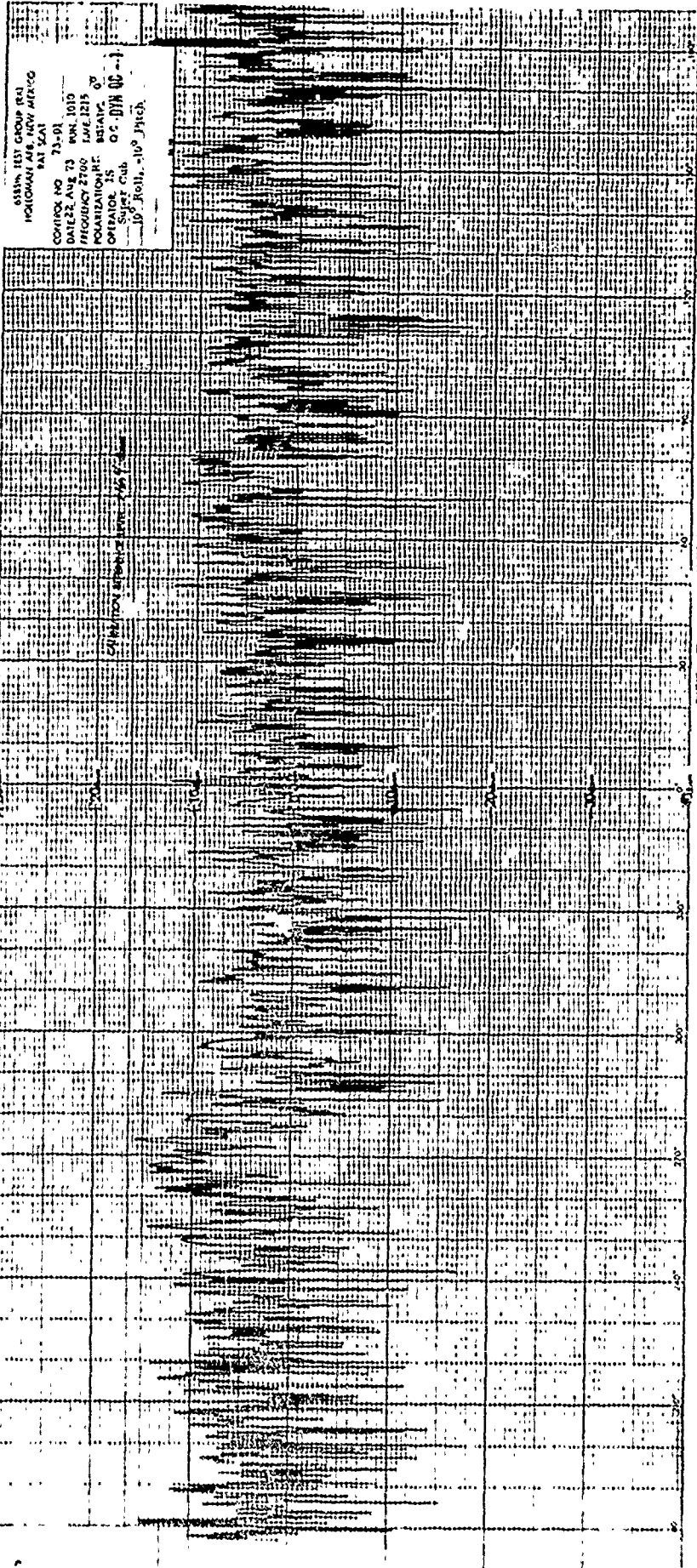
Page 58

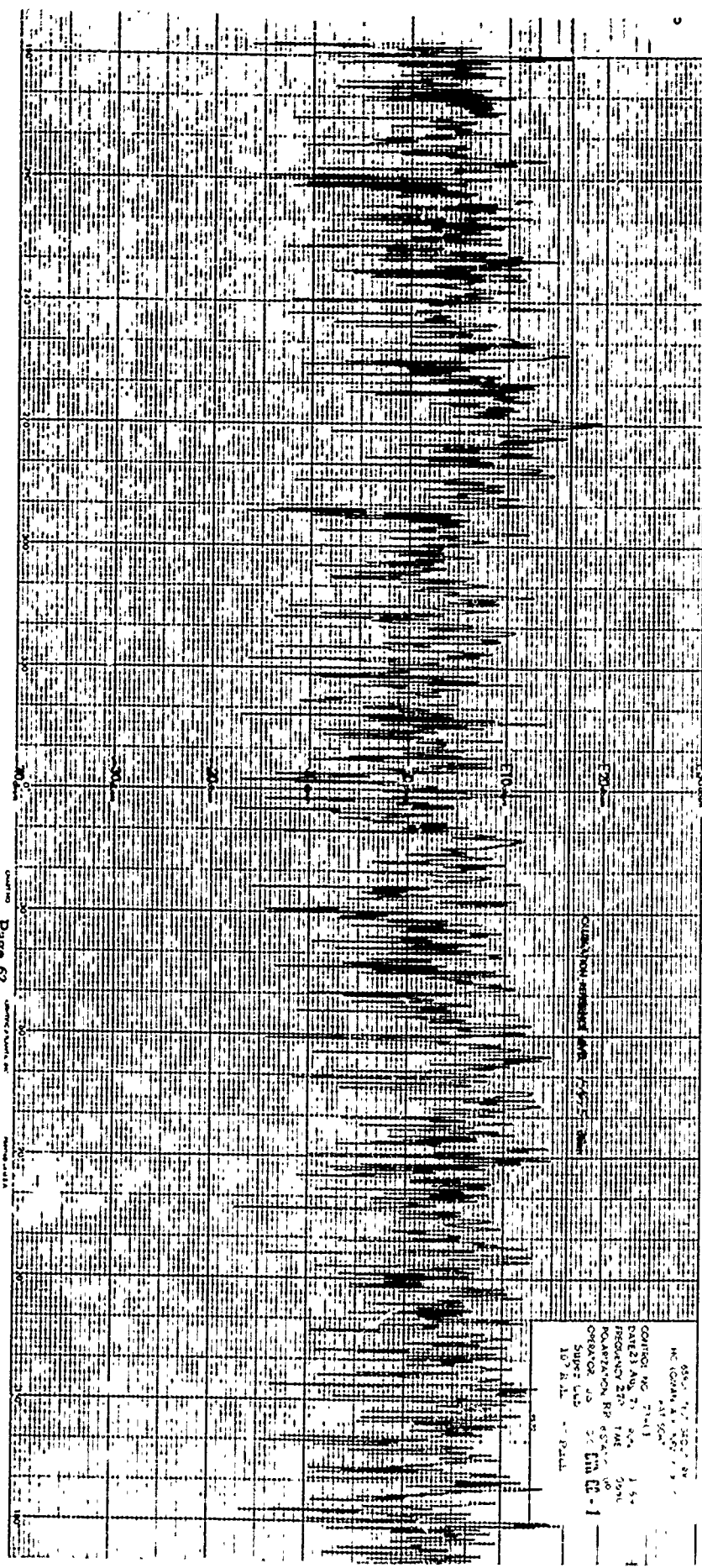
658m 1011 GROUP BA
MOLLOMAN AIR NEW MEXICO
BAT SCAT
CONTROL NO 73-01
DATE 17 AUG 73 RUN 904
FREQUENCY 2700 TUE 1315
POLARIZATION-RR 871A.C. UO
OPERATOR JS OC LIND 10-1
Super Cub
50 Roll 50 Pitch





455 400
DATE 21 Aug 73
TIME 1:16
FREQUENCY 7500 MHz
POLARIZATION RH EDA
COUNTRY
Operator
50 ftch
100 ftch



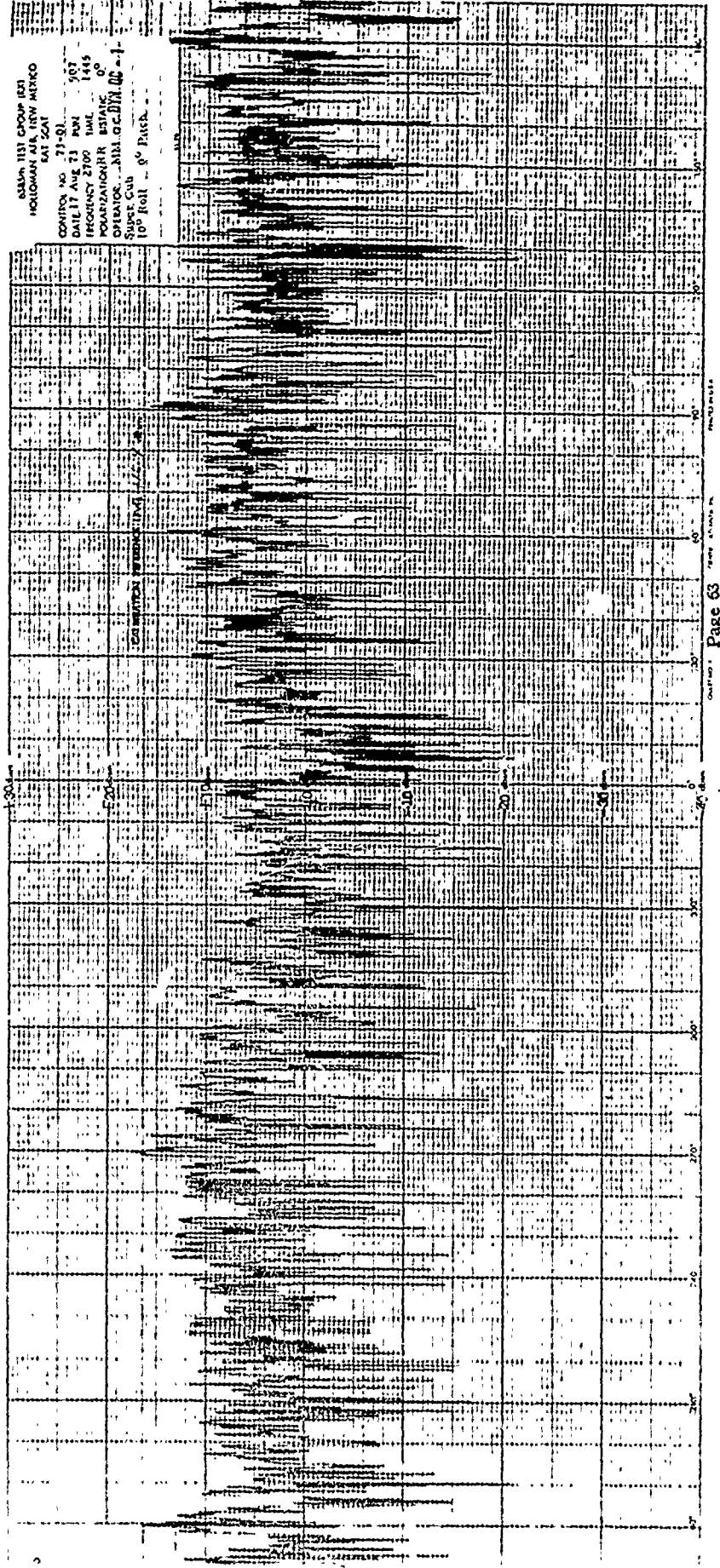


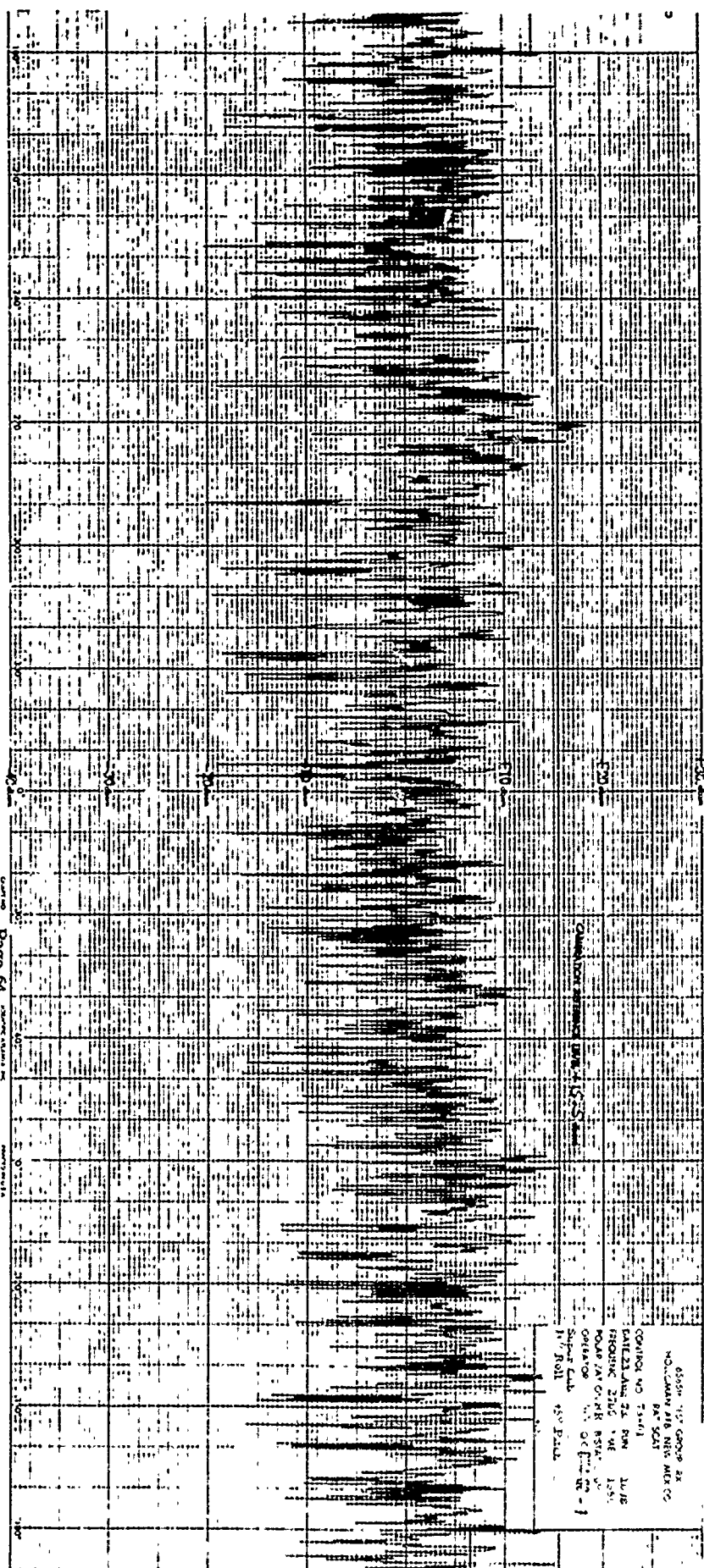
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650 100 1000 20
 MC (GAIN 100 100 100)
 DATE 21 AUG 71 04 15
 FREQUENCY 210 TIME 1000
 POLARIZATION RP 0500
 OPERATOR J.S. 20 010 00-1
 SUPERVISOR 100 000 000
 100 000 000

ASUN 1137 GROUP 1831
HOLLOMAN AFB, NEW MEXICO
LAT 36.1

CONTROL NO. 71-81
DATE 17 AUG 73
FREQUENCY 2700 MHz
POLARIZATION R ESTATIC
OPERATOR BILL G. DUNN
SUPERVISOR
10° Roll 8° Pitch

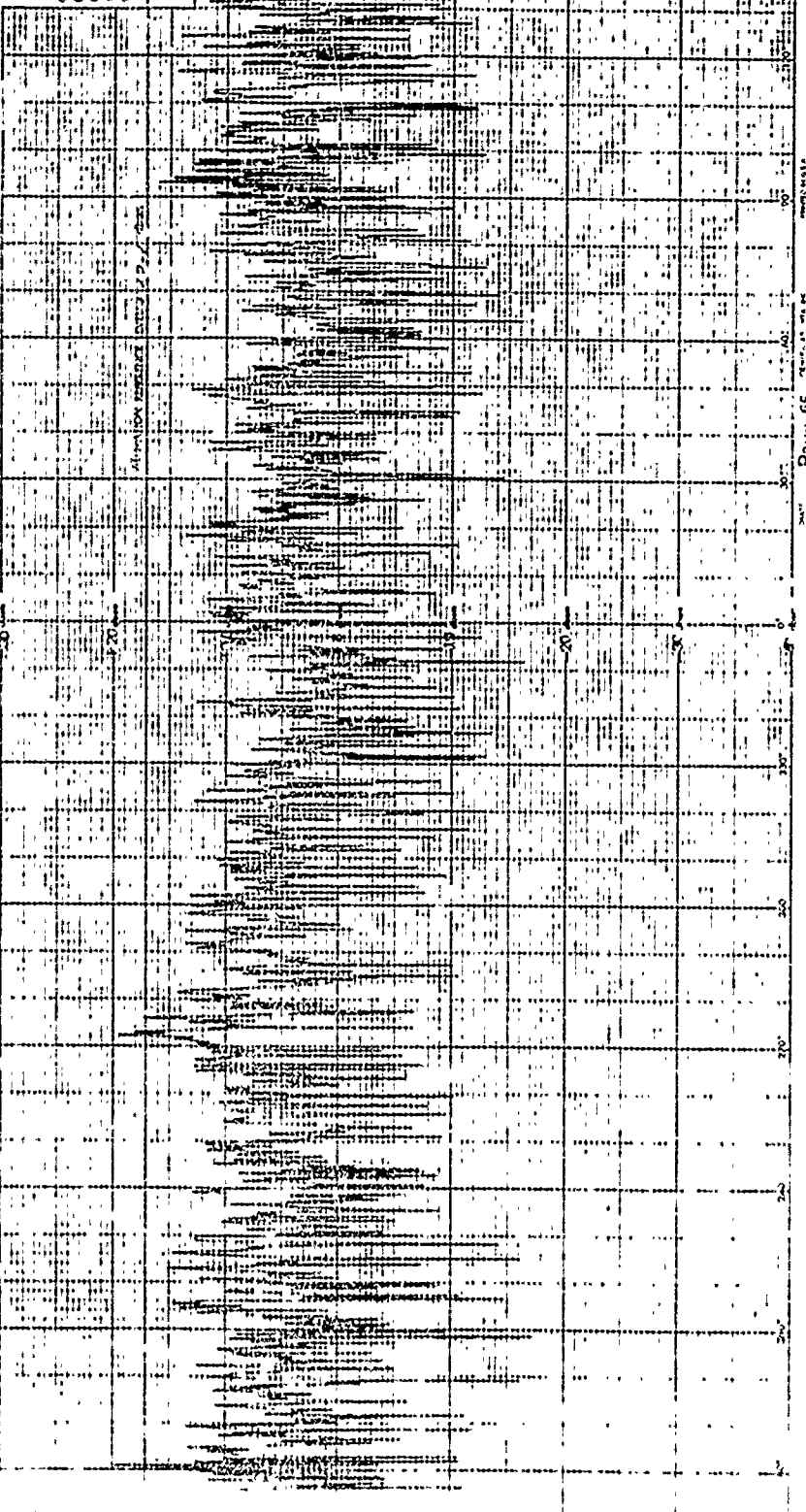


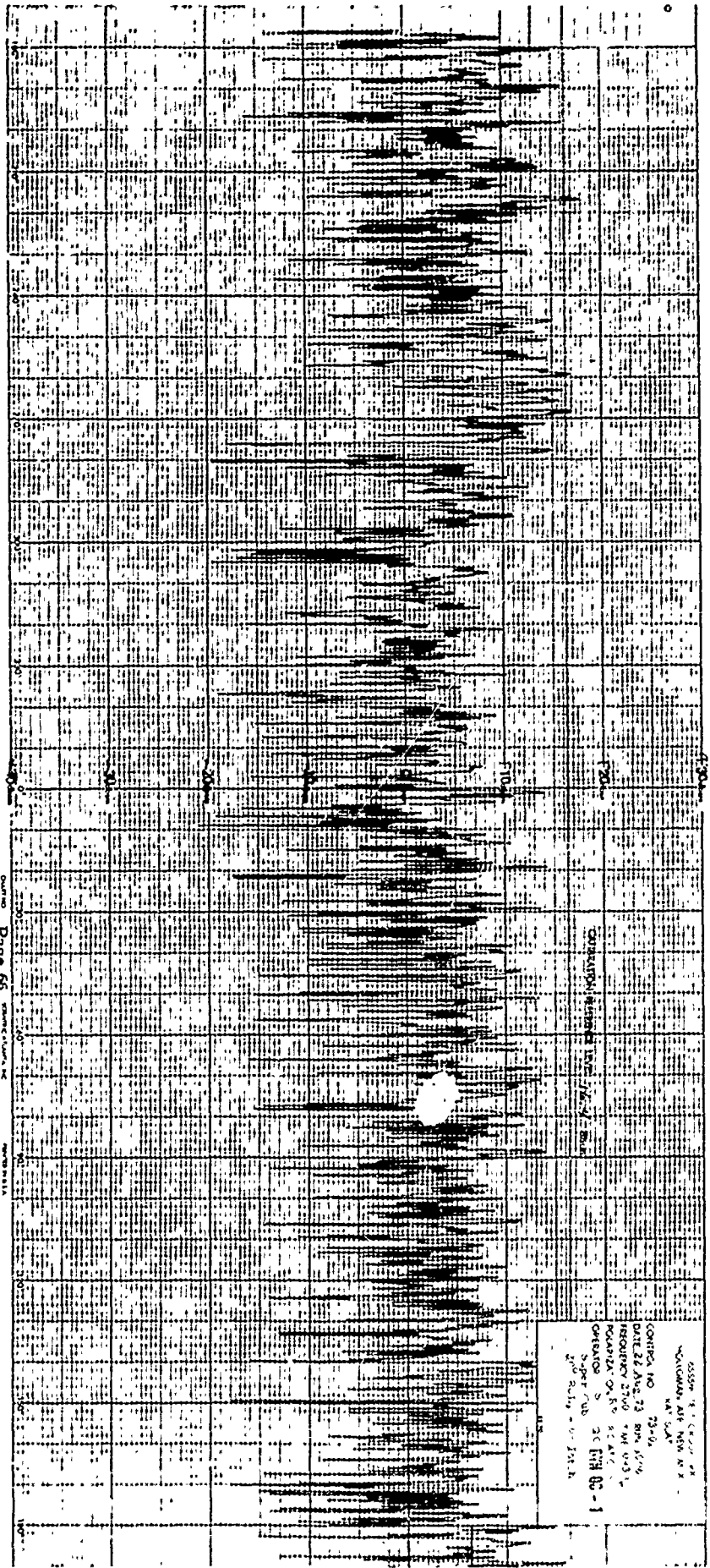


4553- 1ST GROUP PK
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CONTROL NO 23-01
DATE 21 AUG 73
TIME 1147
FROM DCA 2700
TO ARADON RR 43141, 07

OPERATOR IS ON
SUPERVISOR IS ON

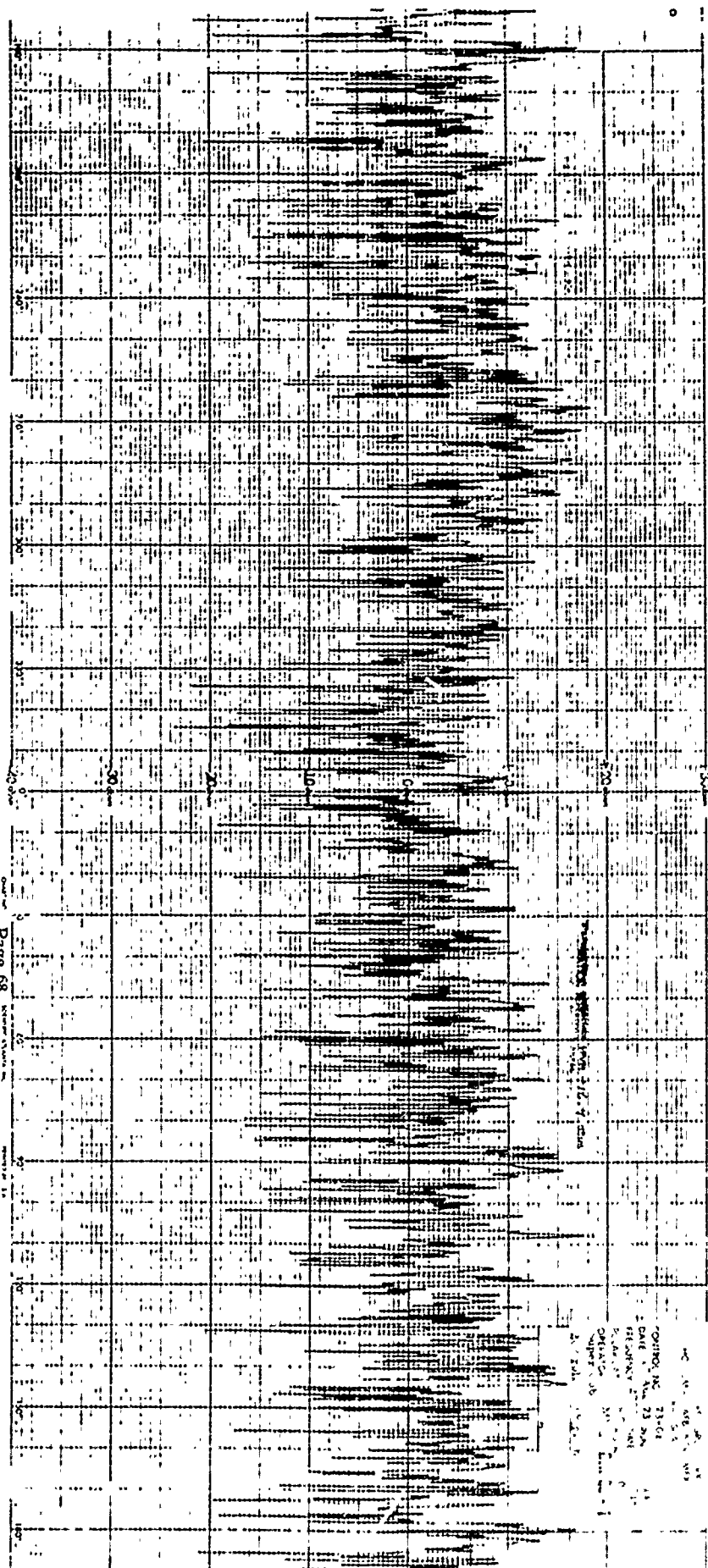




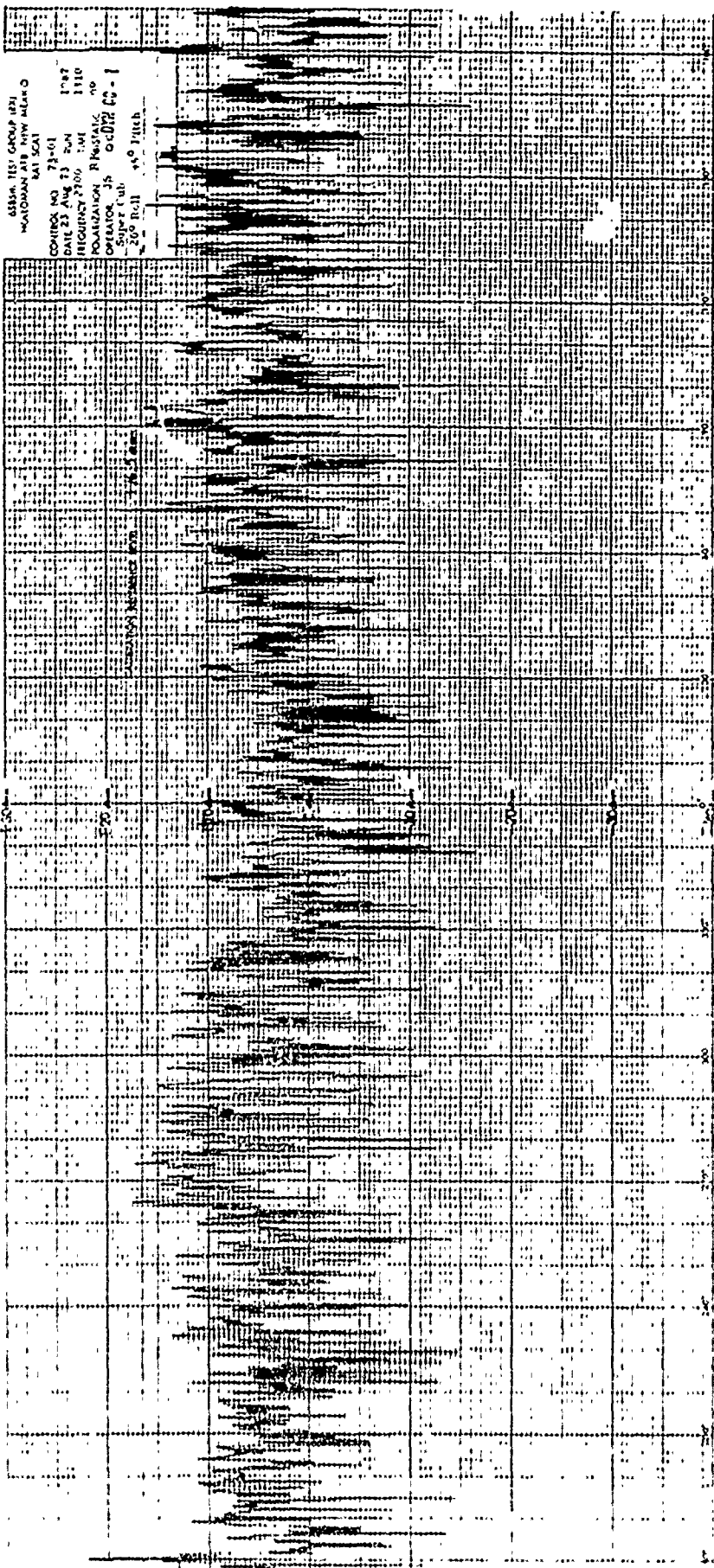
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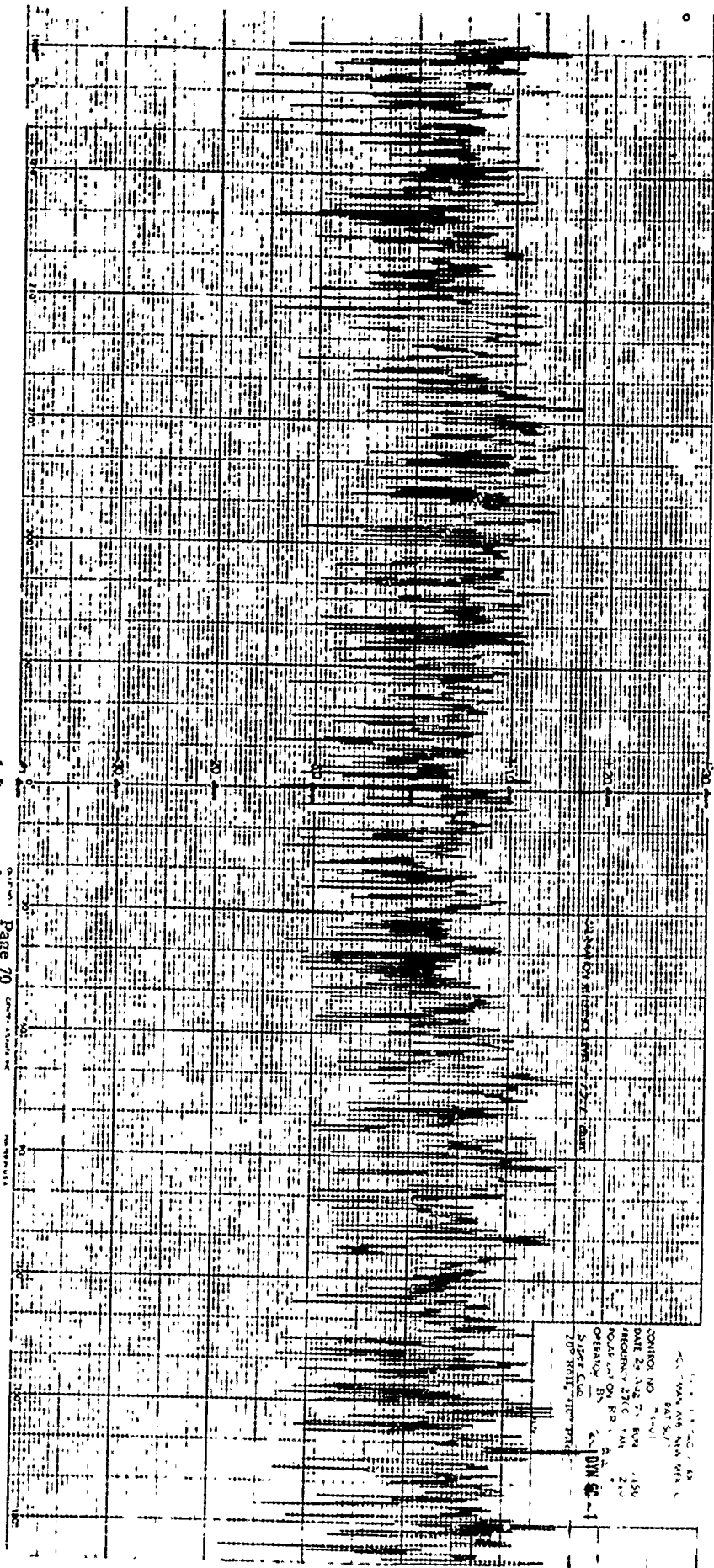
ASSIGN 1-1 (C-101) 2X
WACAMAN, AIR NEW N X
XAV 547
CONTROL NO 73-01
DATE 22 AUG 73 BY 1576
FREQUENCY 2700 XAV 035
POWERS 0X 50 30 40
ORBITAL 2 30 [711 02-1]
Super Club
2nd Subj - 10 12 14

4854 101 GROUP 21
 HONOLULU, HAWAII
 21° 54' N
 157° 05' W
 CONTROL NO 13-01
 DATE 23 AUG 73
 FREQUENCY 2700 KHZ
 MODULATION 100%
 OPERATOR
 SUPERVISOR
 200 HALL

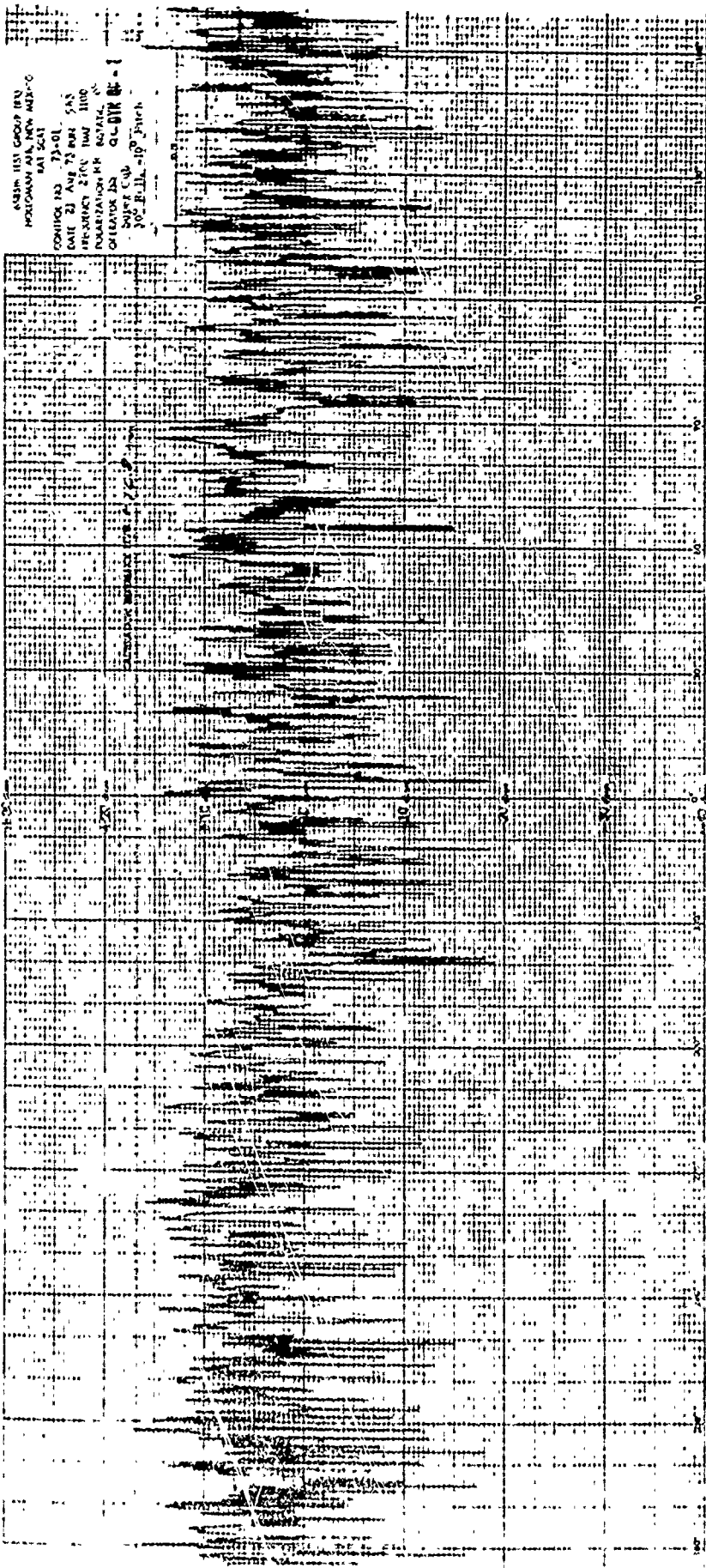


ASSN. TEST GROUP 821
WATSONIAN AIR NEW MEXICO
LAT 34° 15' N
LONG 106° 15' W
DATE 23 AUG 55
TIME 1110
FREQUENCY 27.00 MHz
MODULATION PULSATC
OPERATOR JF
SUPERVISOR GCDT
NO. 1
NO. 1110

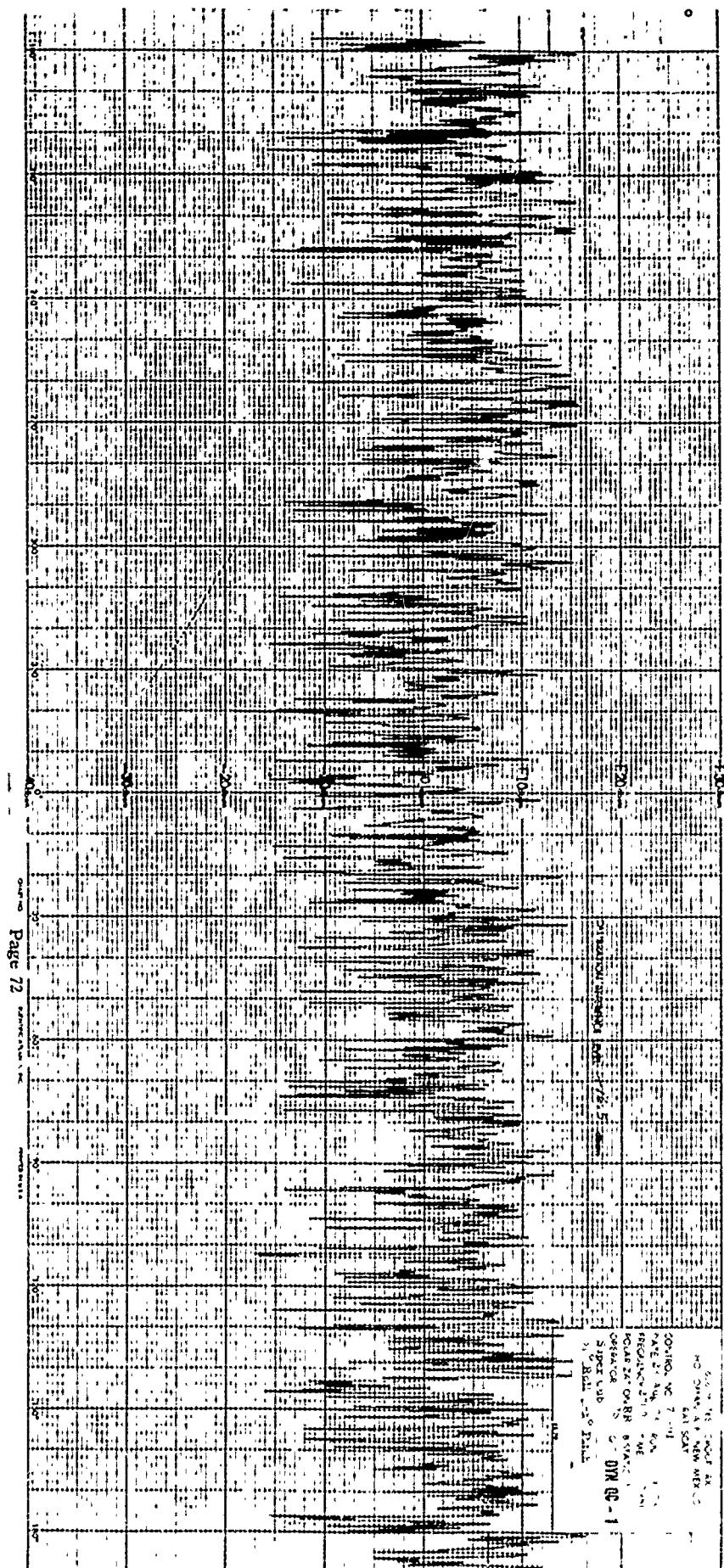


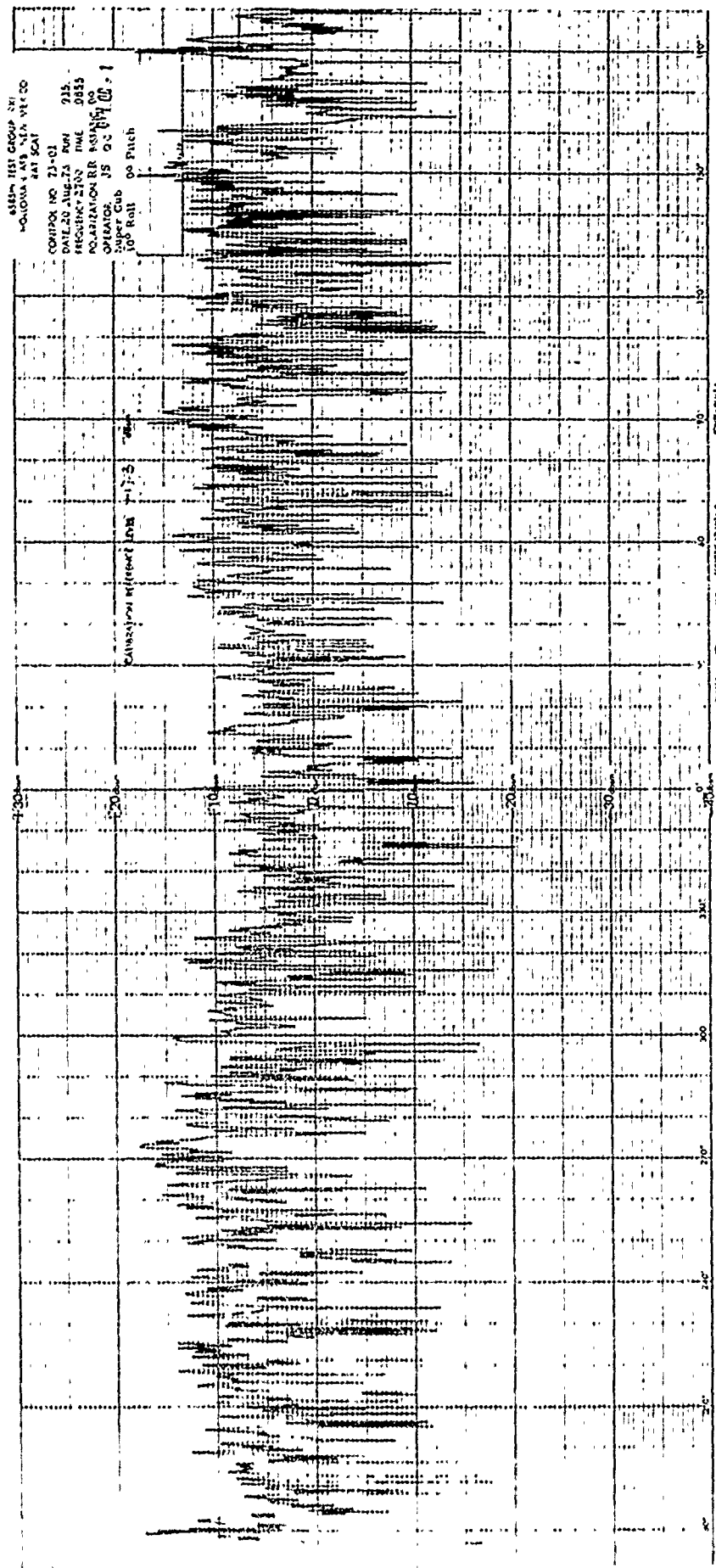


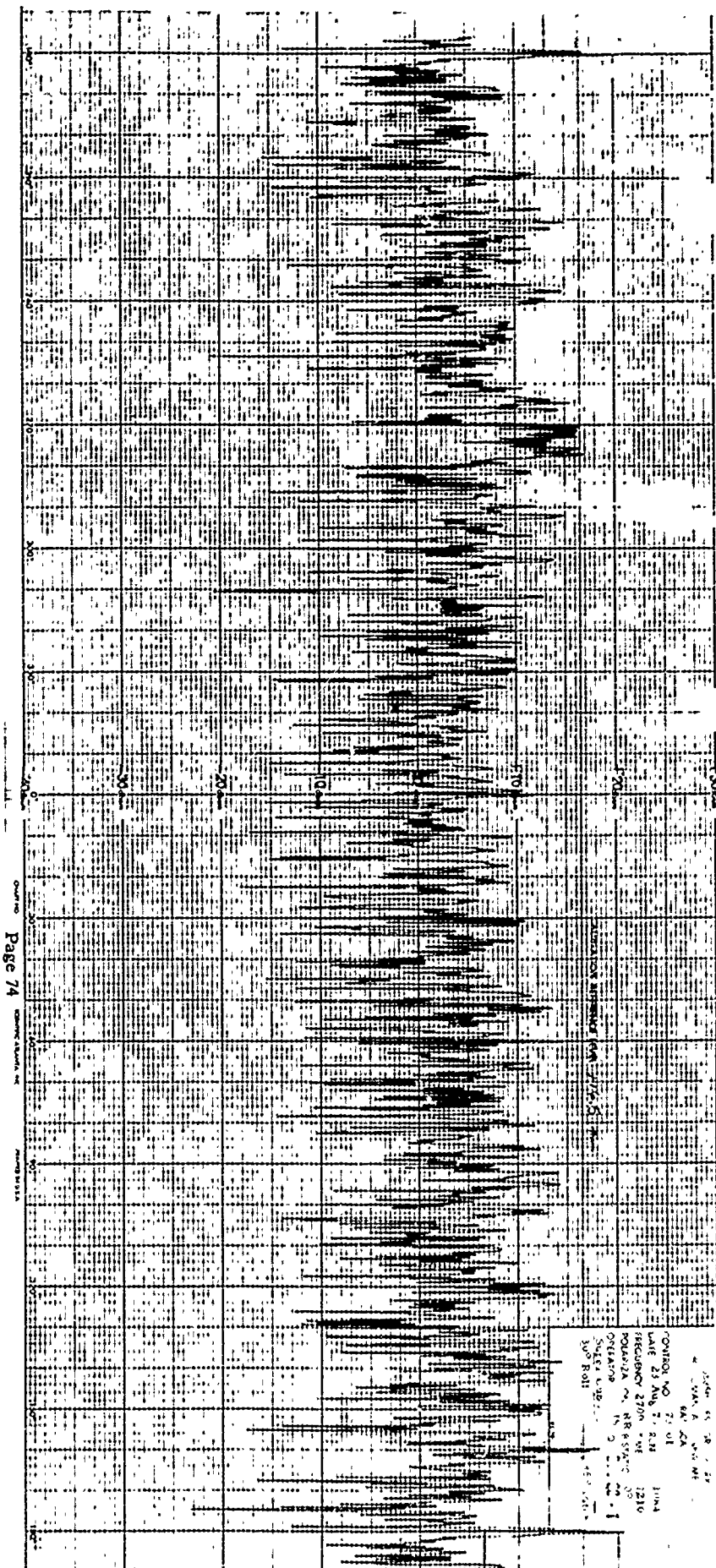
CONTROL NO. 100
 DATE 25 JUL 71
 INCIDENT 216
 LOCAL 216
 ORIGIN 216
 207 RTH-100 TMC
 207 RTH-100 TMC

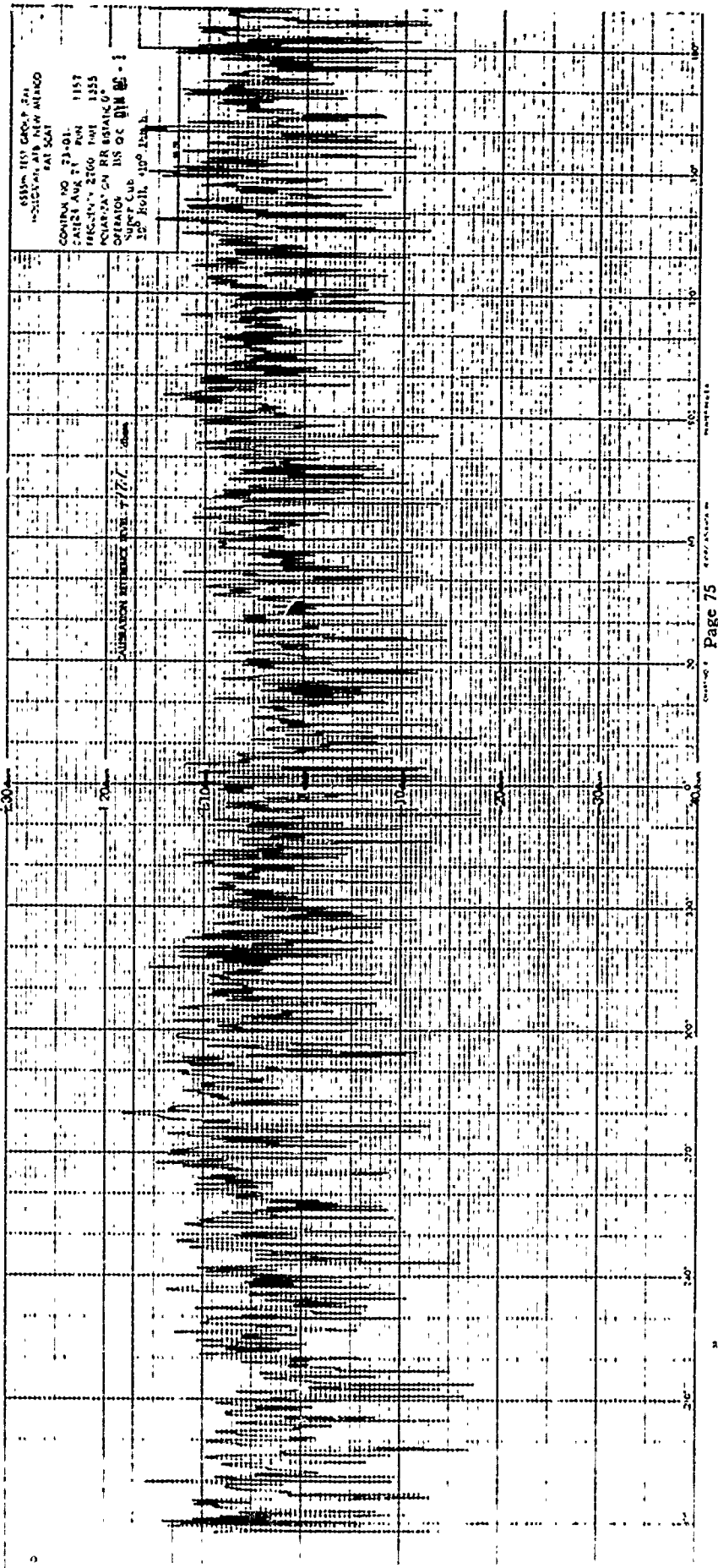


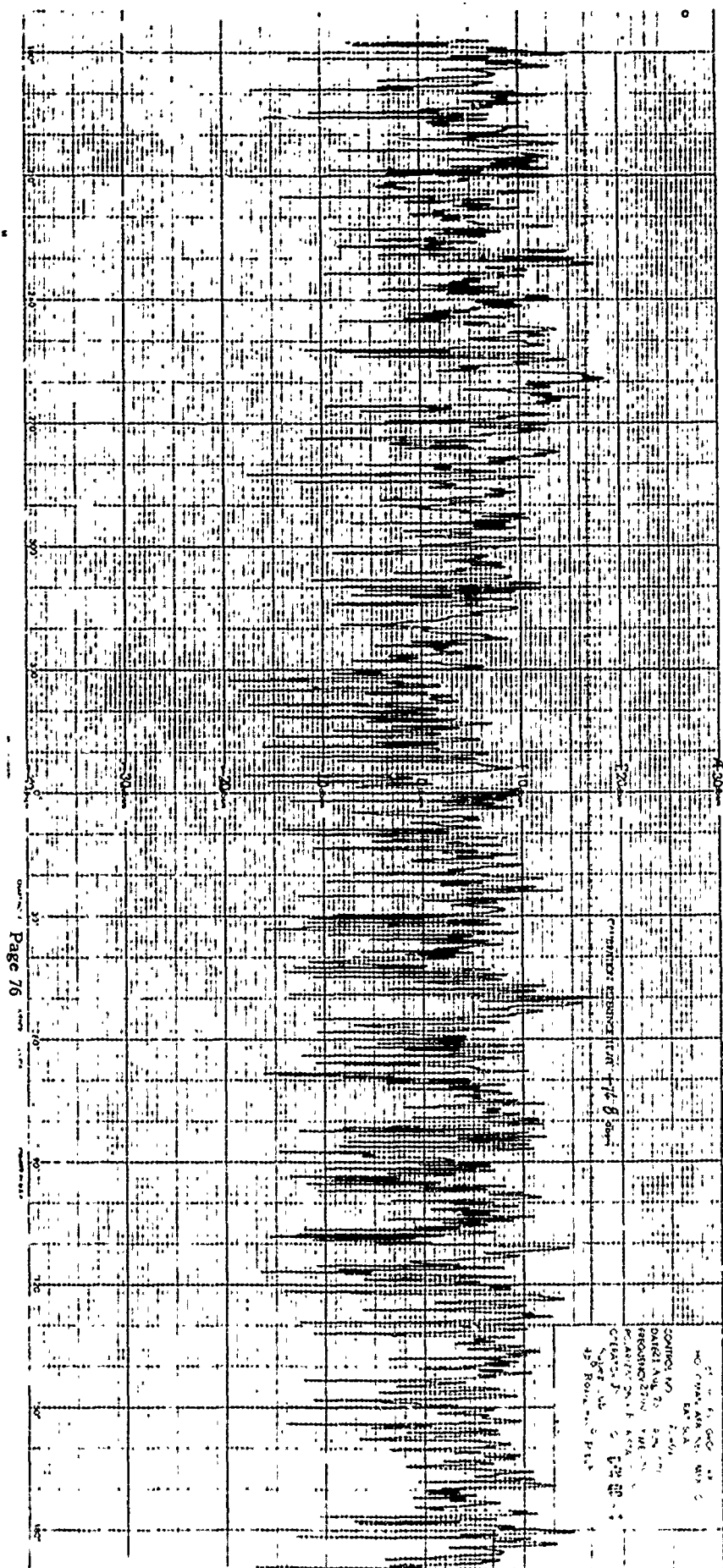
ALISH TEST GROUP 18U
HOLLOMAN AFB, NEW MEXICO
LAT 34-1
CONTROL NO. 73-01
DATE 21 AUG 75 PER 543
FREQUENCY 2700 THRU 1100
POLARIZATION RH ROTATED 90
ORIENTATION IN Q-LDR 85-1
SOLAR CUB -10° Jitter
NO. ELL -10° Jitter

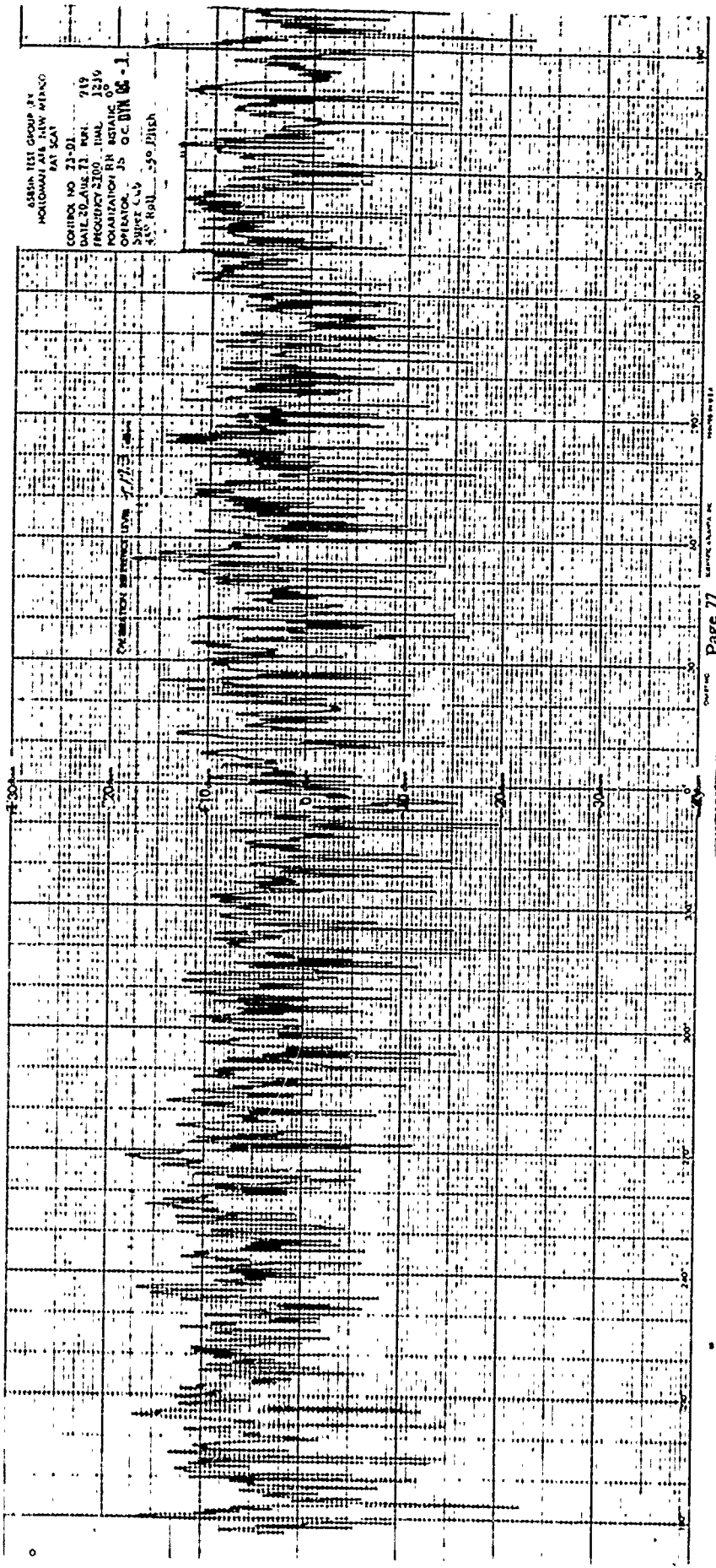


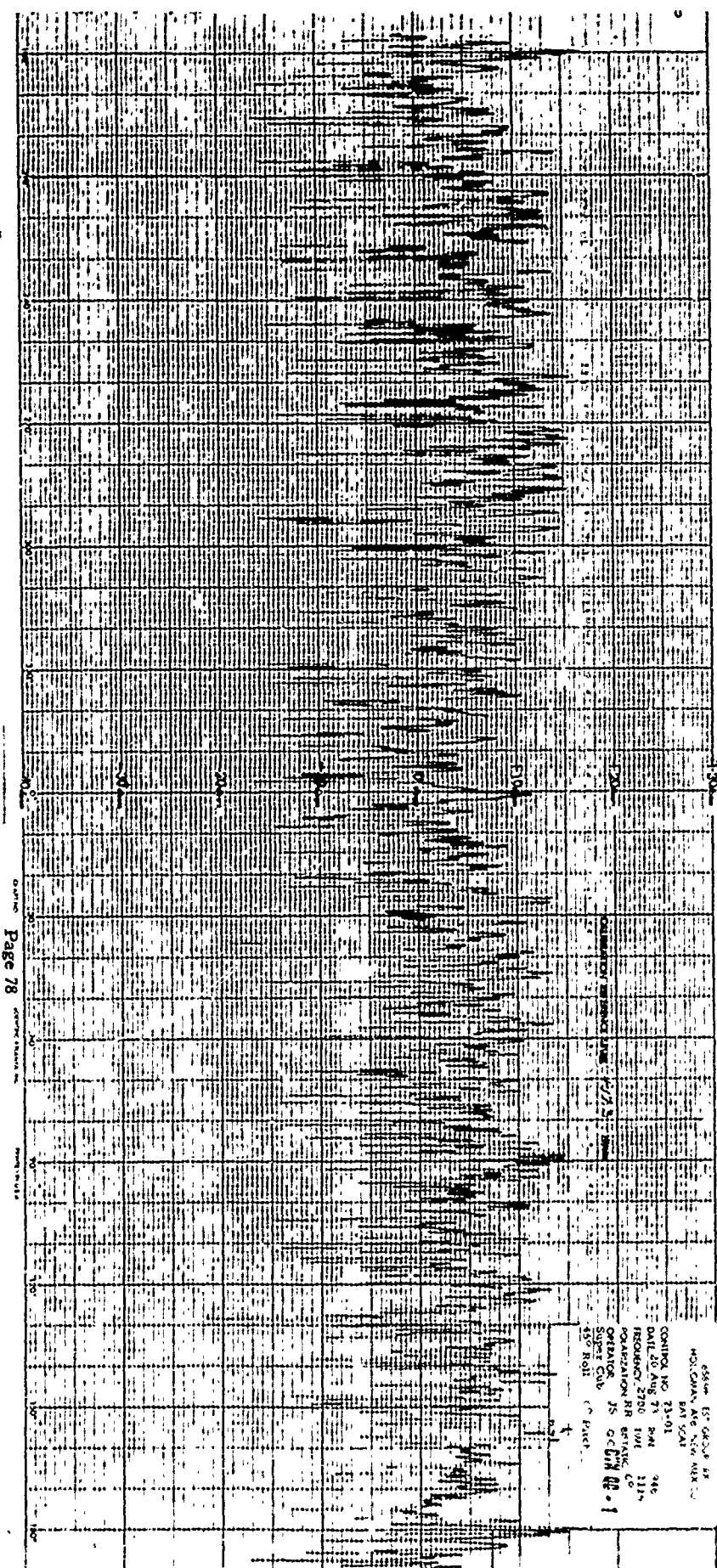






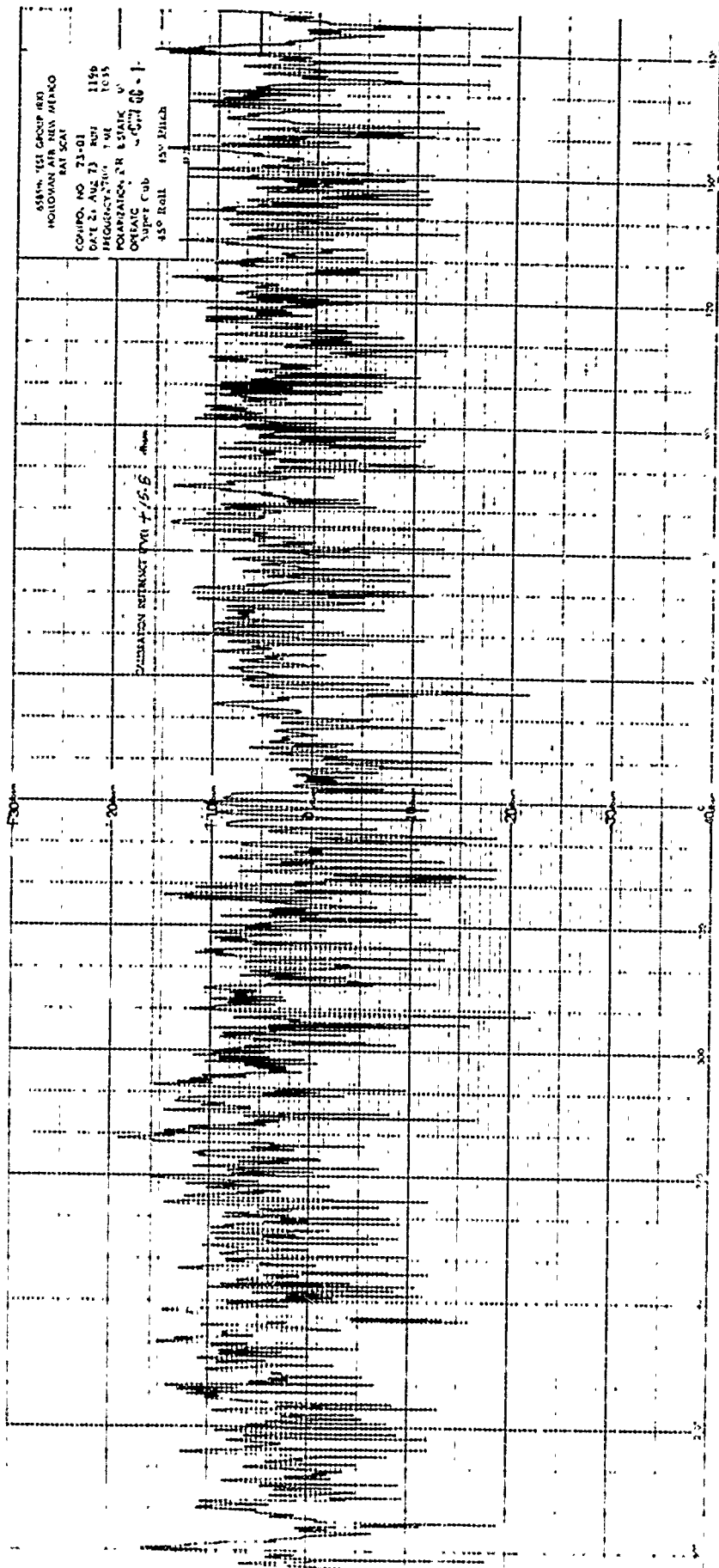


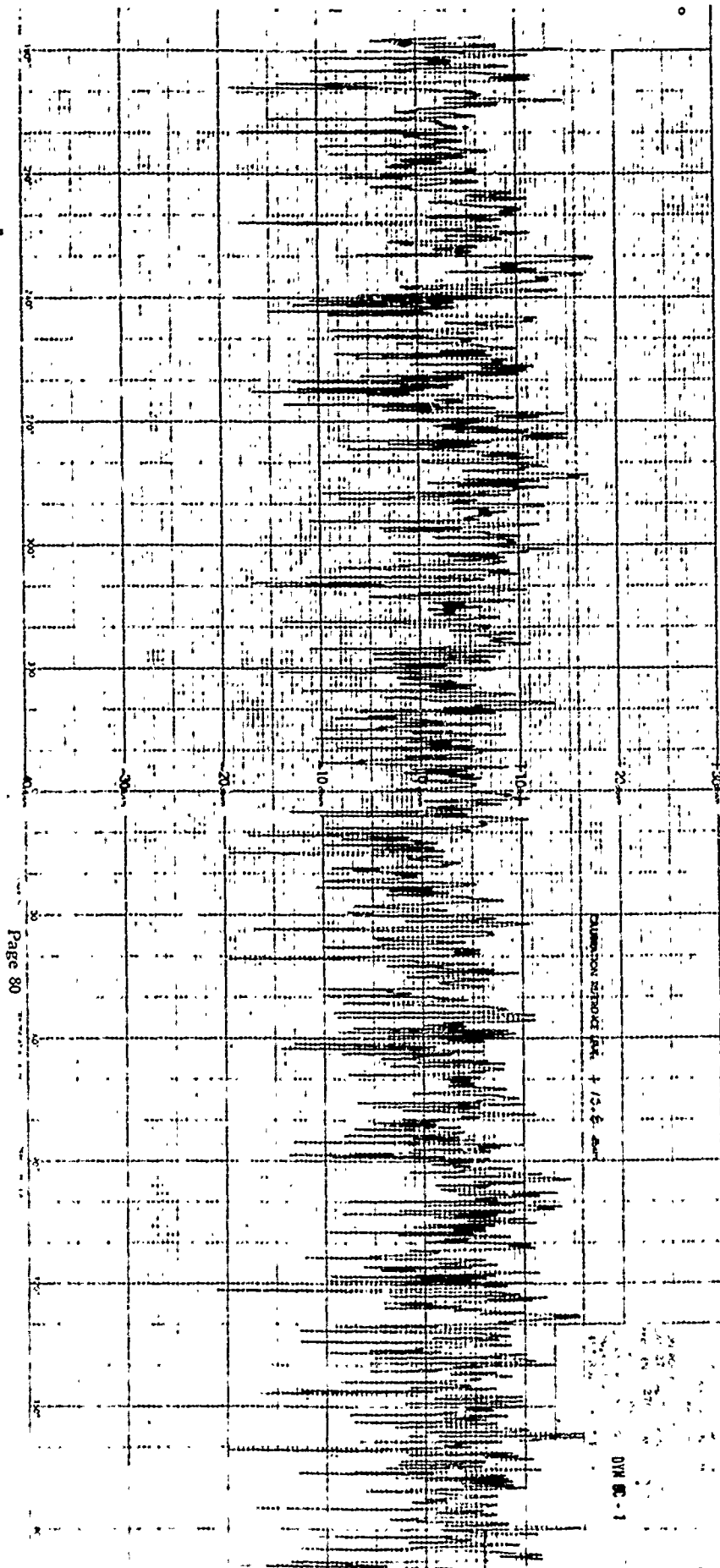




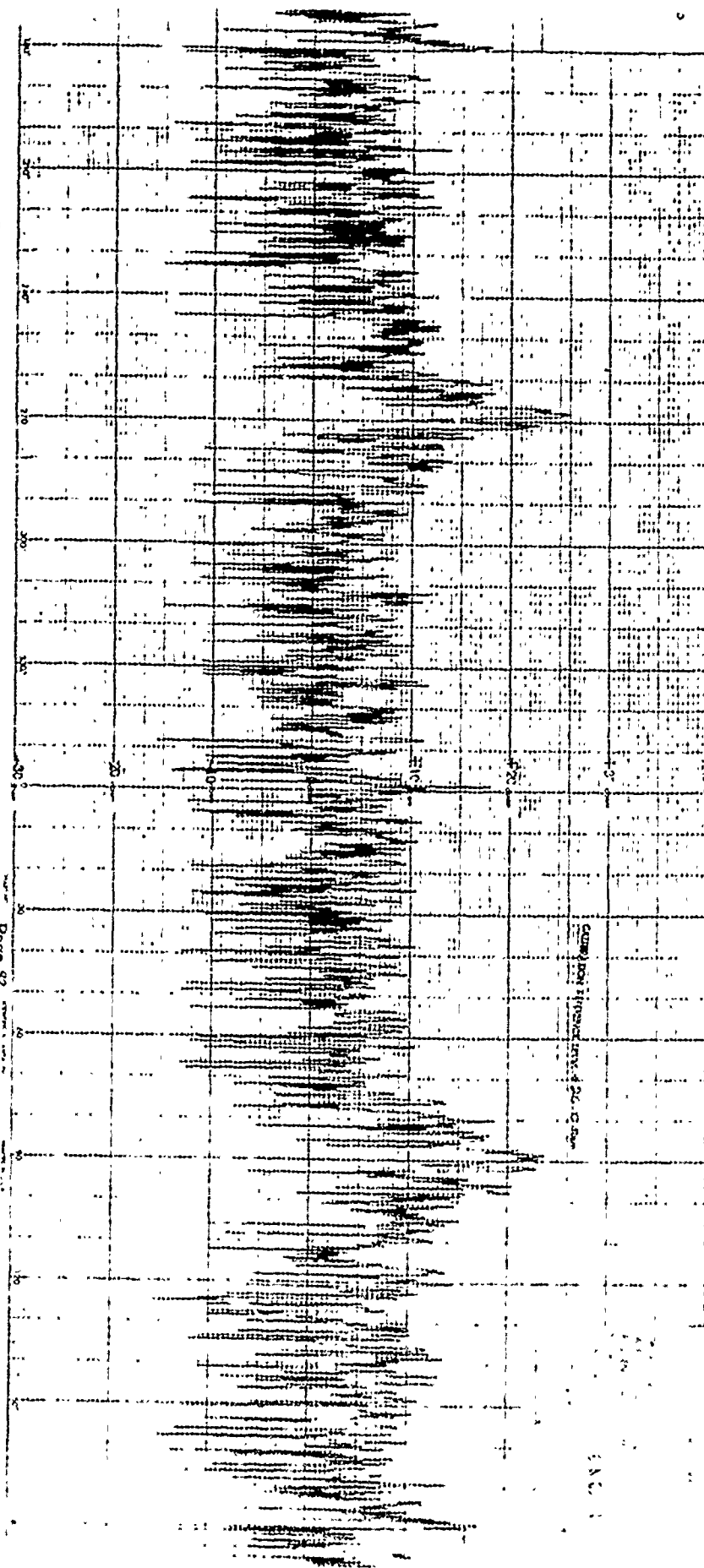
Page 78

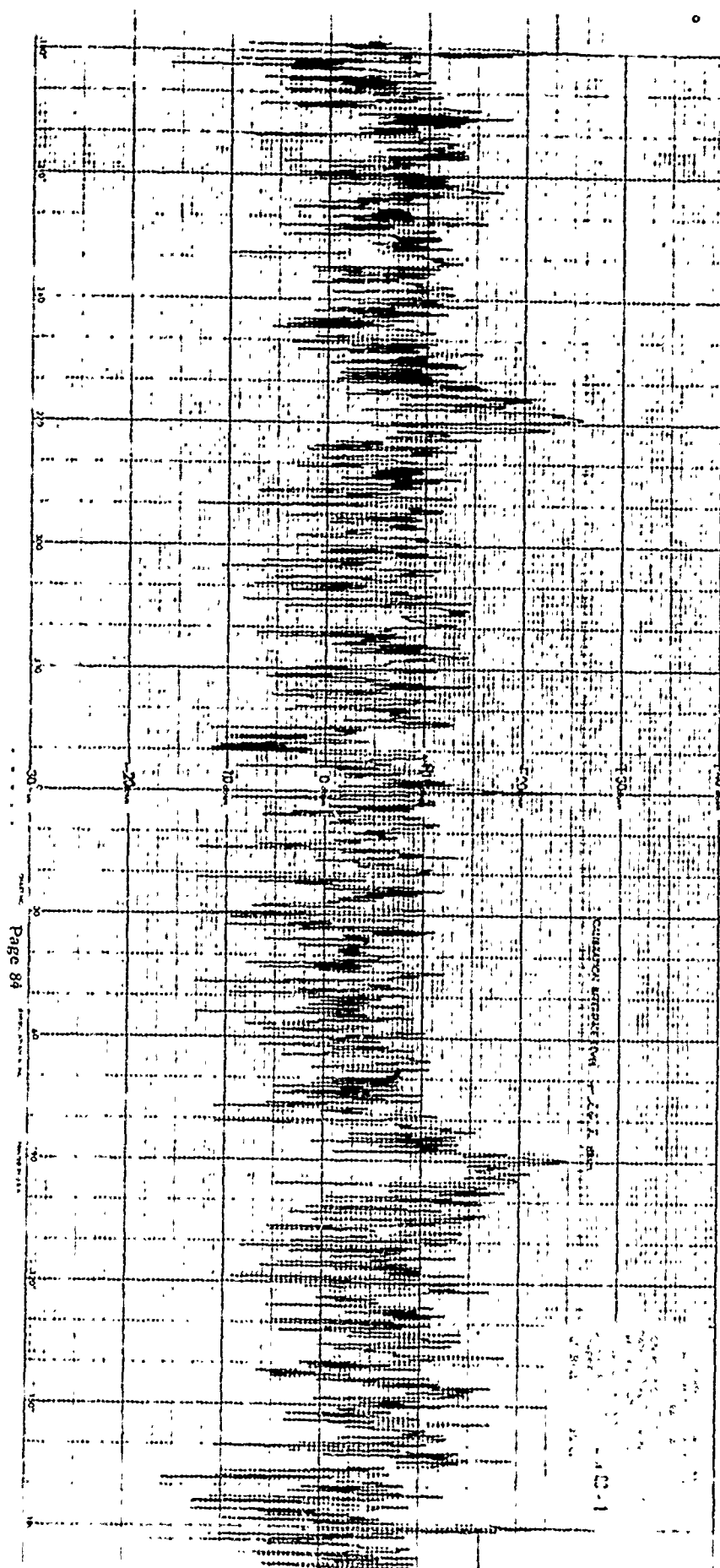
6544 157 6820 14
 HOS. GAN. ARE NEW REX 10
 PAT SON
 CONTROL NO. 13-01 946
 DATE 20 AUG 71 PM 1114
 RESEARCH 2700 INT 1114
 RESEARCH RR ESTABL CO
 ORIGINATOR JS OCBIN 48-1
 Supra Club
 157 Roll 10 Pict.

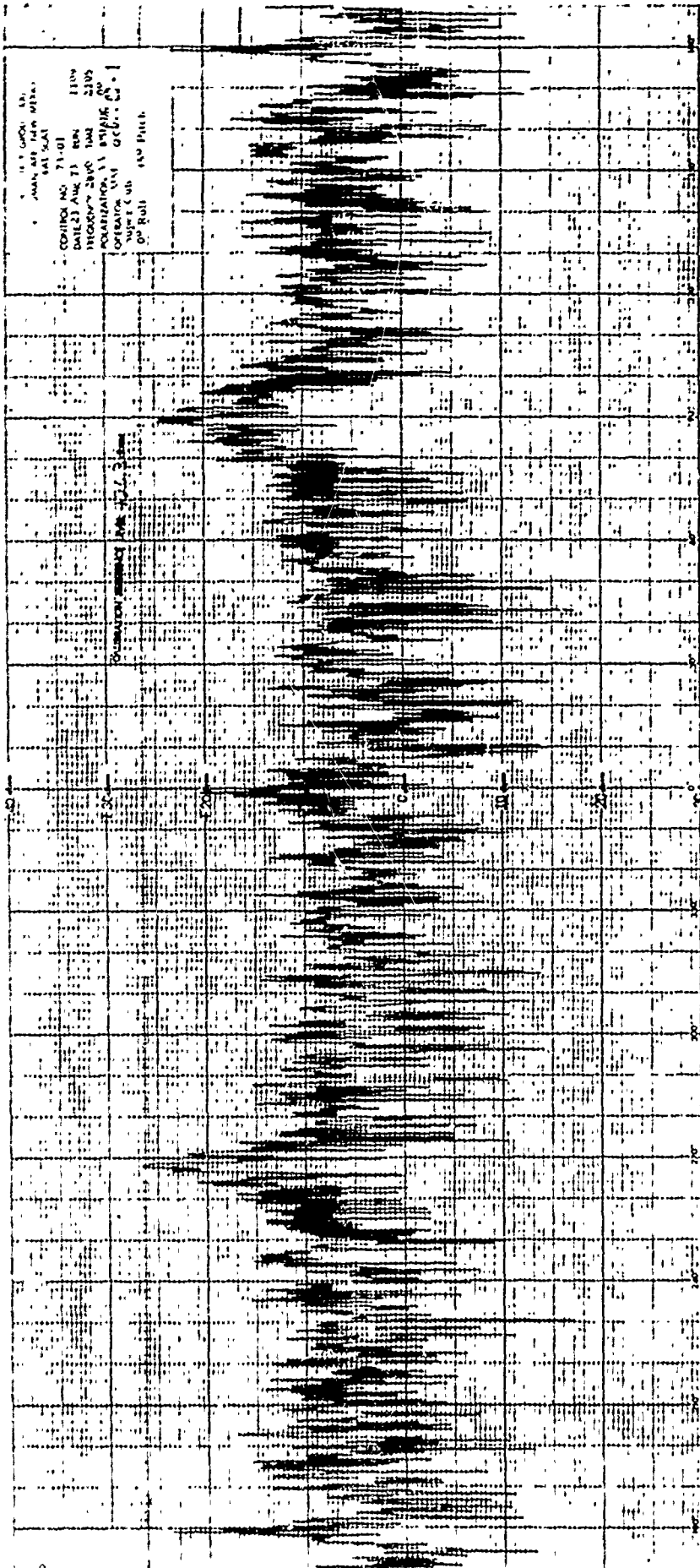




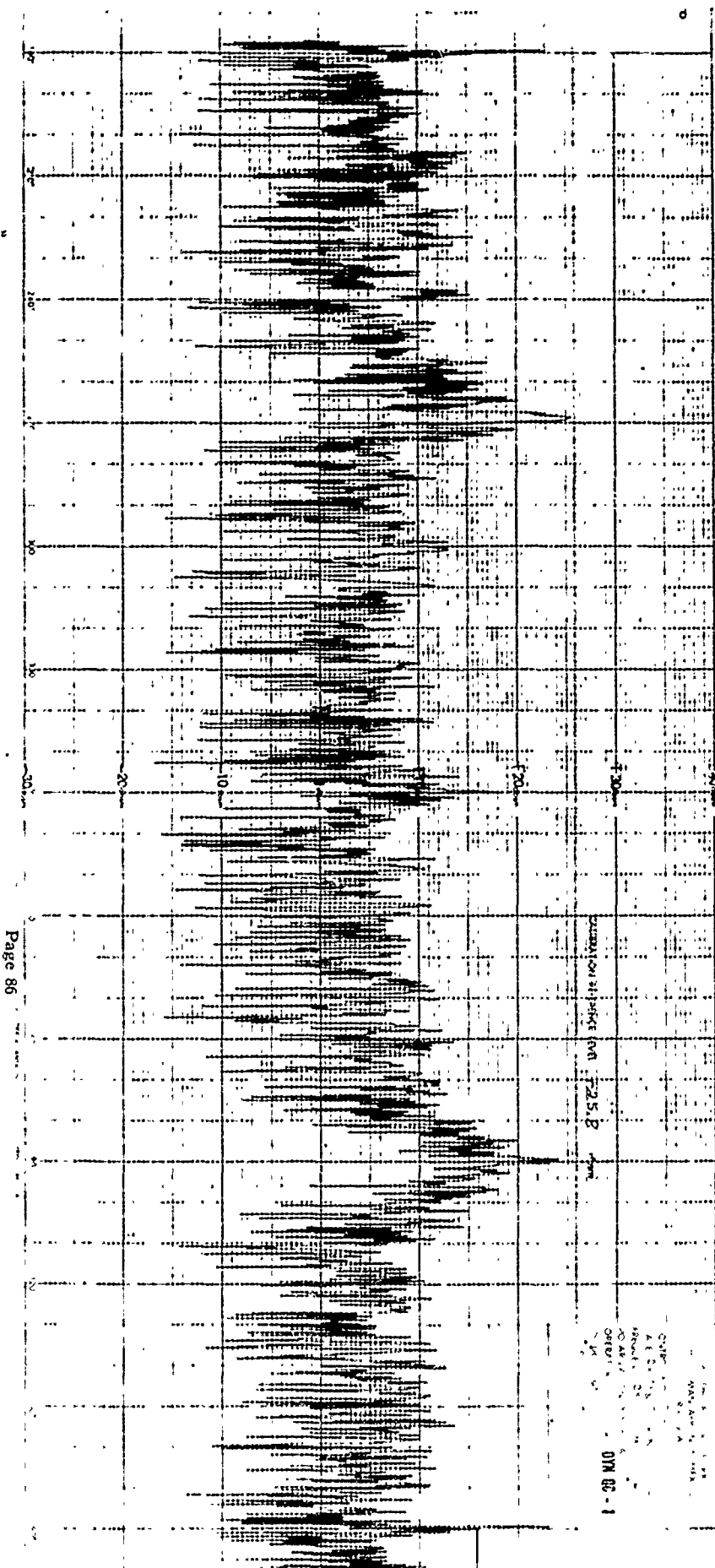
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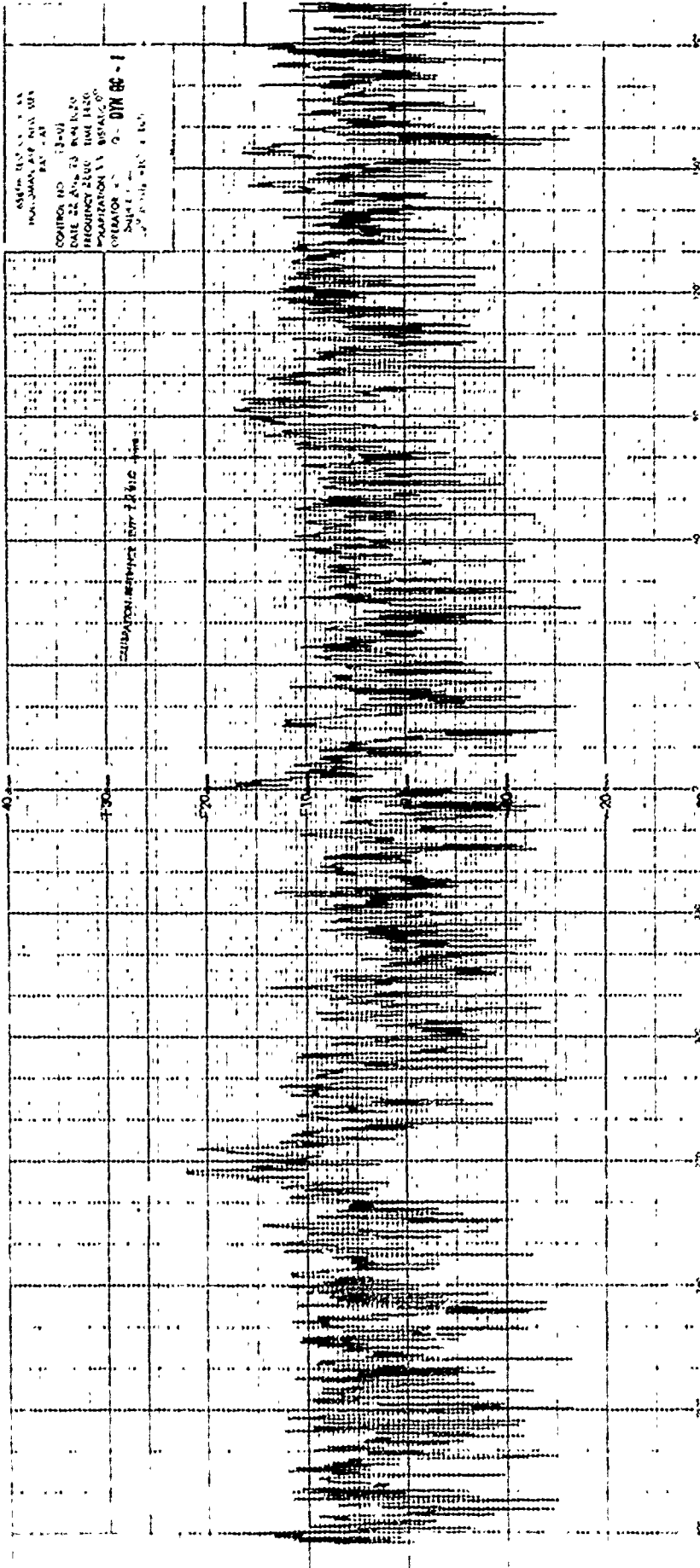


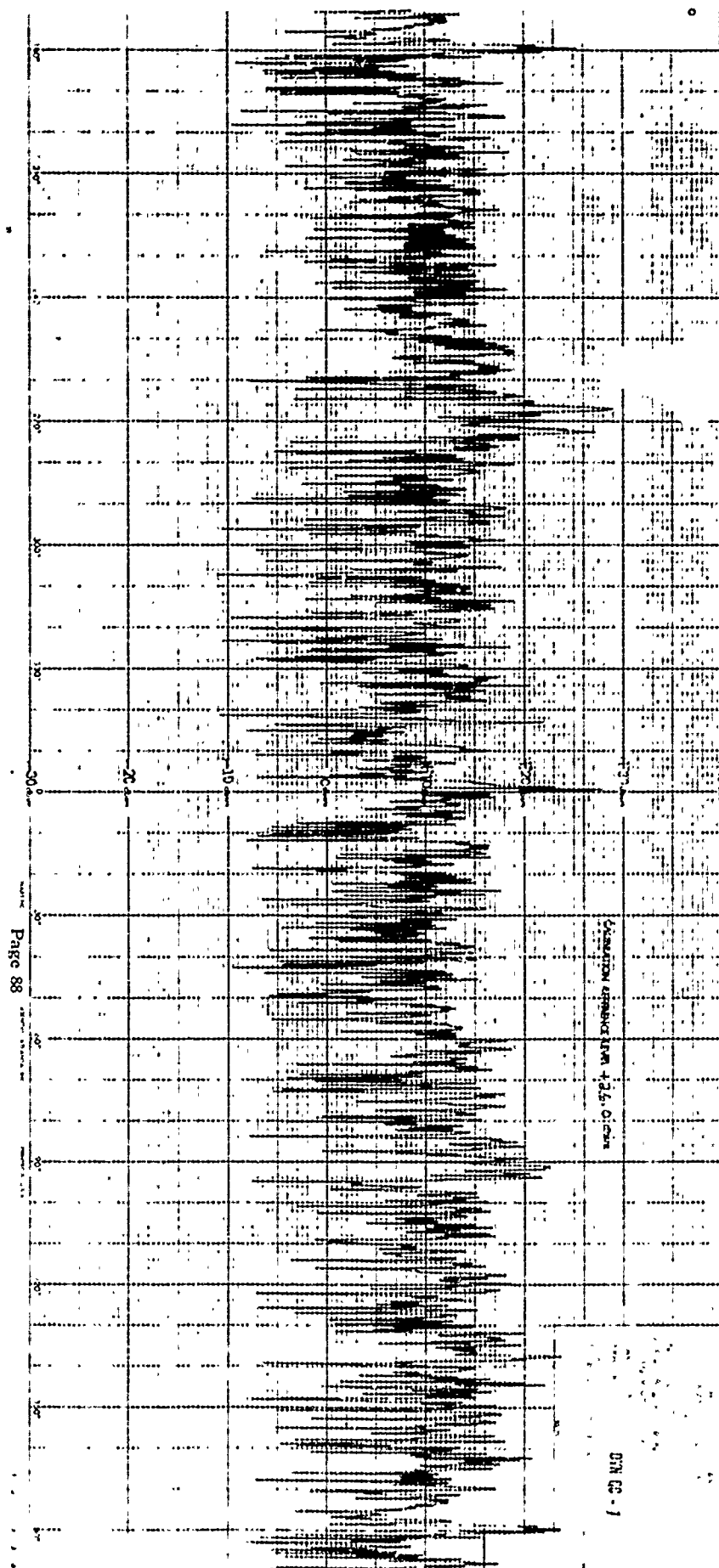


1000 1000 1000
JAN 1973
CONTR NO 71-01
DATE 27 AUG 73
THORNTON 2800 1000
POLARIZATION 11 051000
OPERATION 1101 000000
000 Roll 1000 Pitch

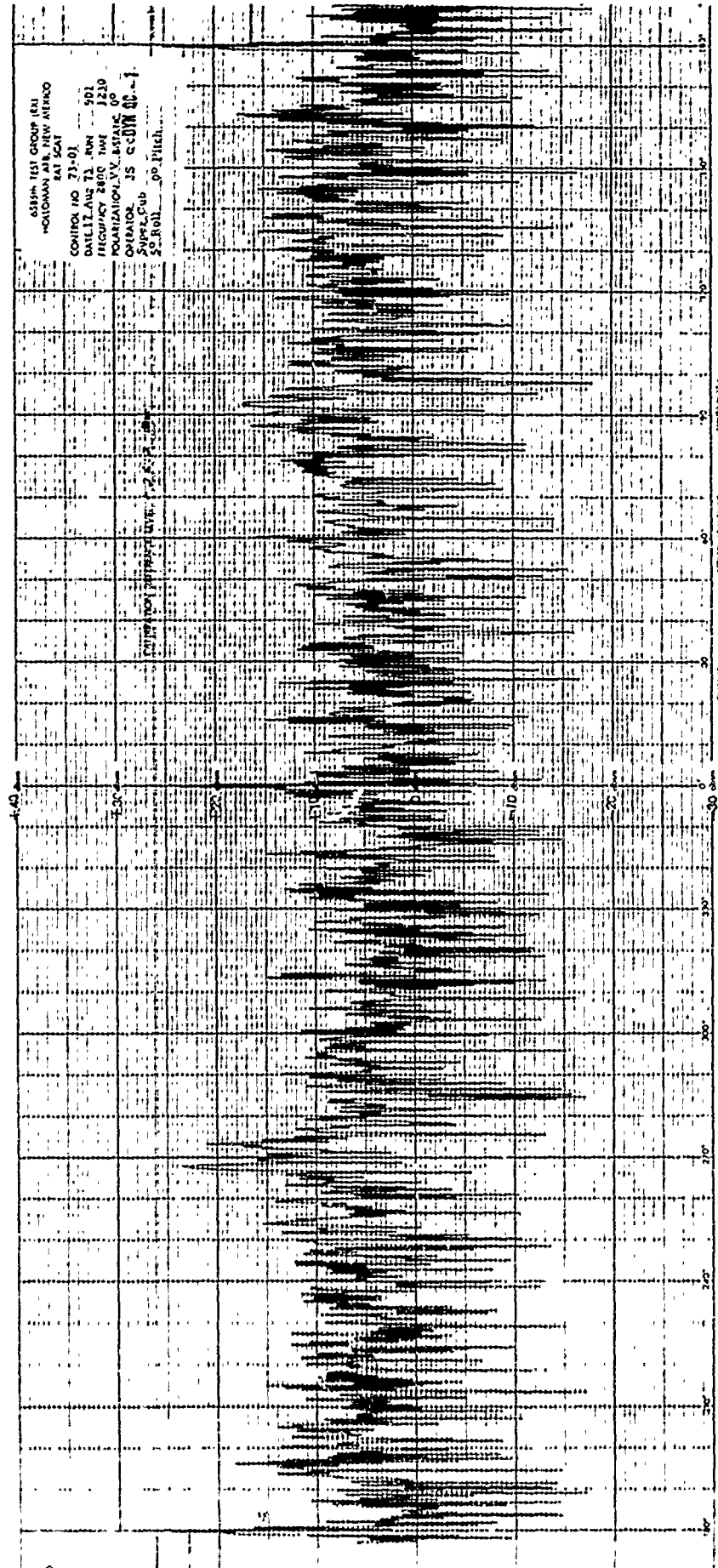


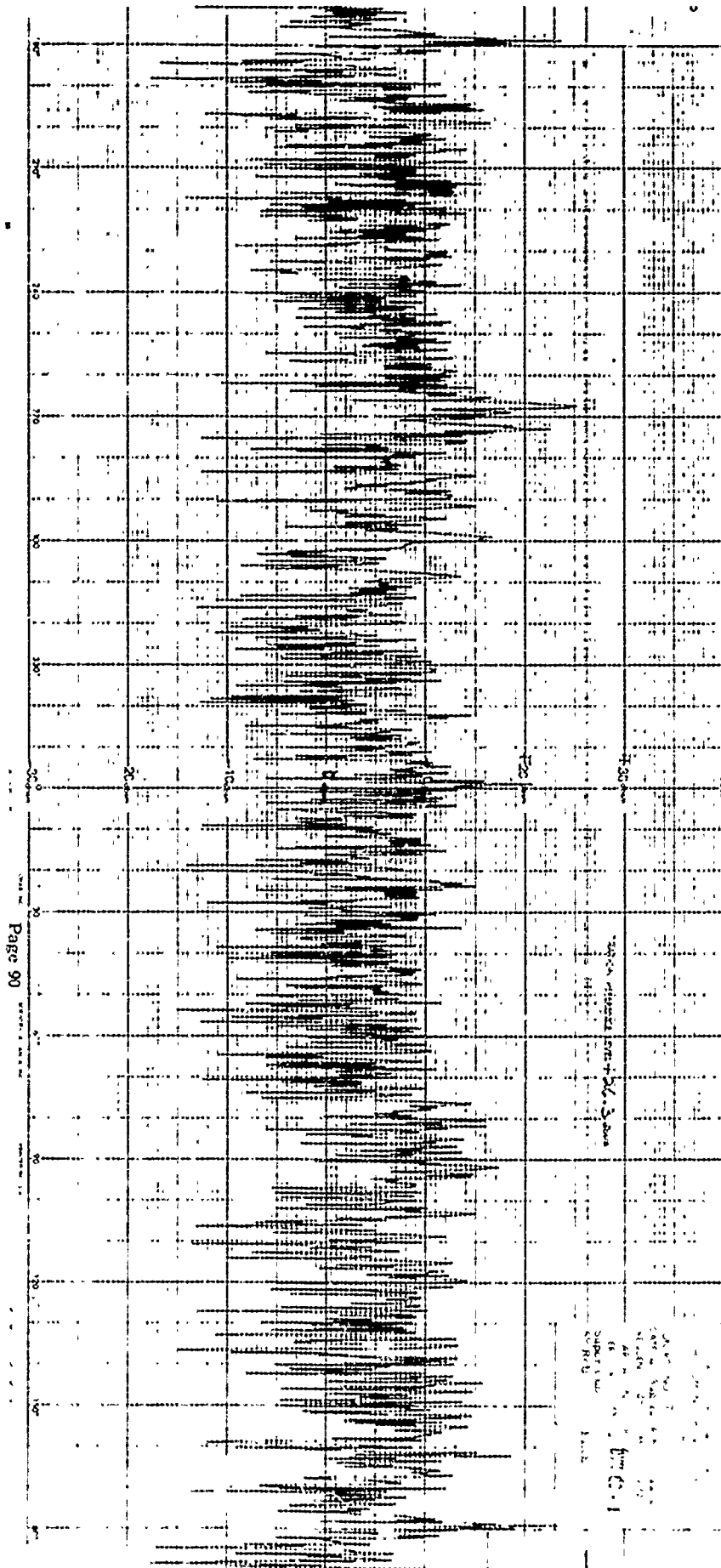
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 4. SECTION
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 8. STATE
 9. COUNTRY
 10. ZIP
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 12. TELETYPE
 13. TELEFAX
 14. EMAIL
 15. WWW
 16. FTP
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 18. MAIL
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 22. STREET
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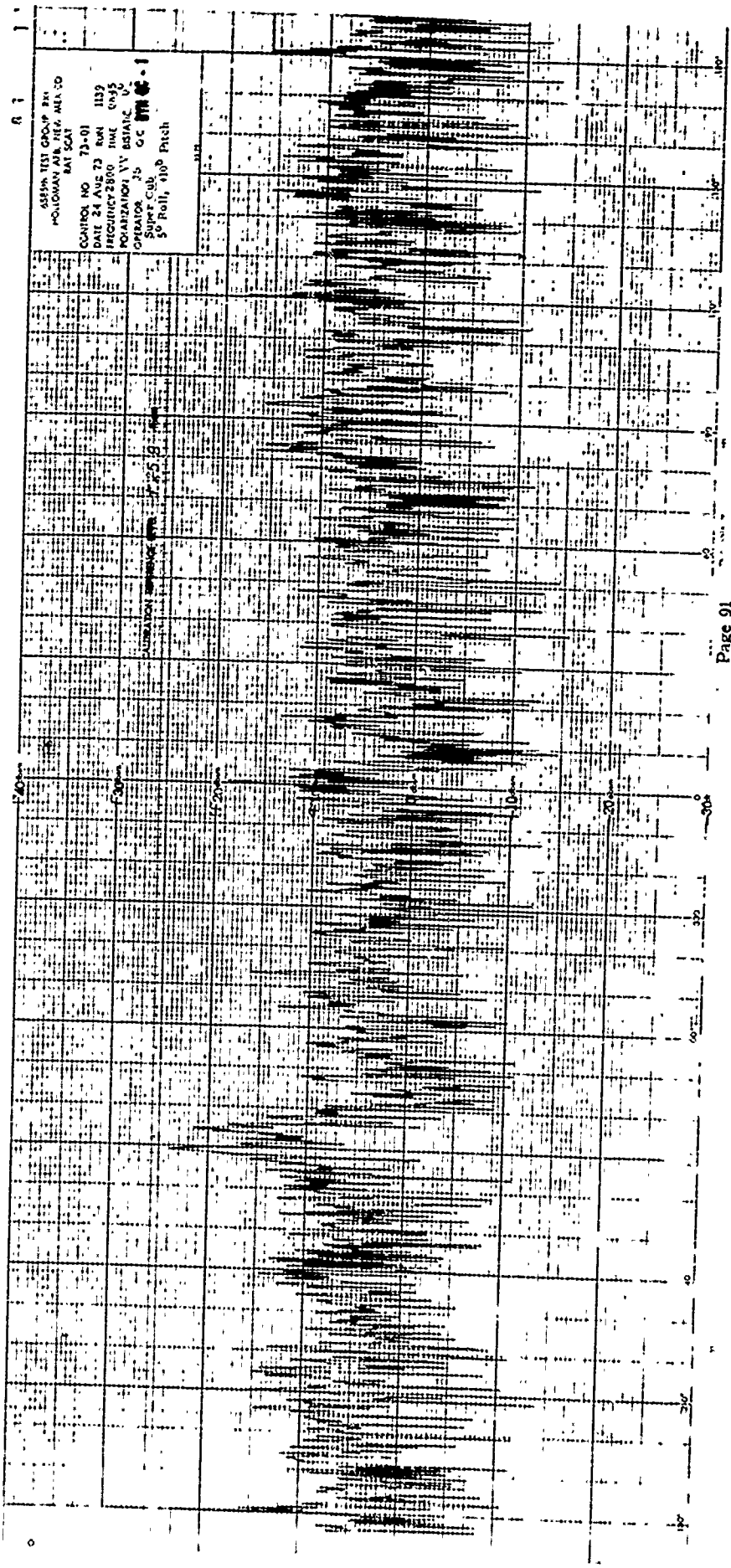


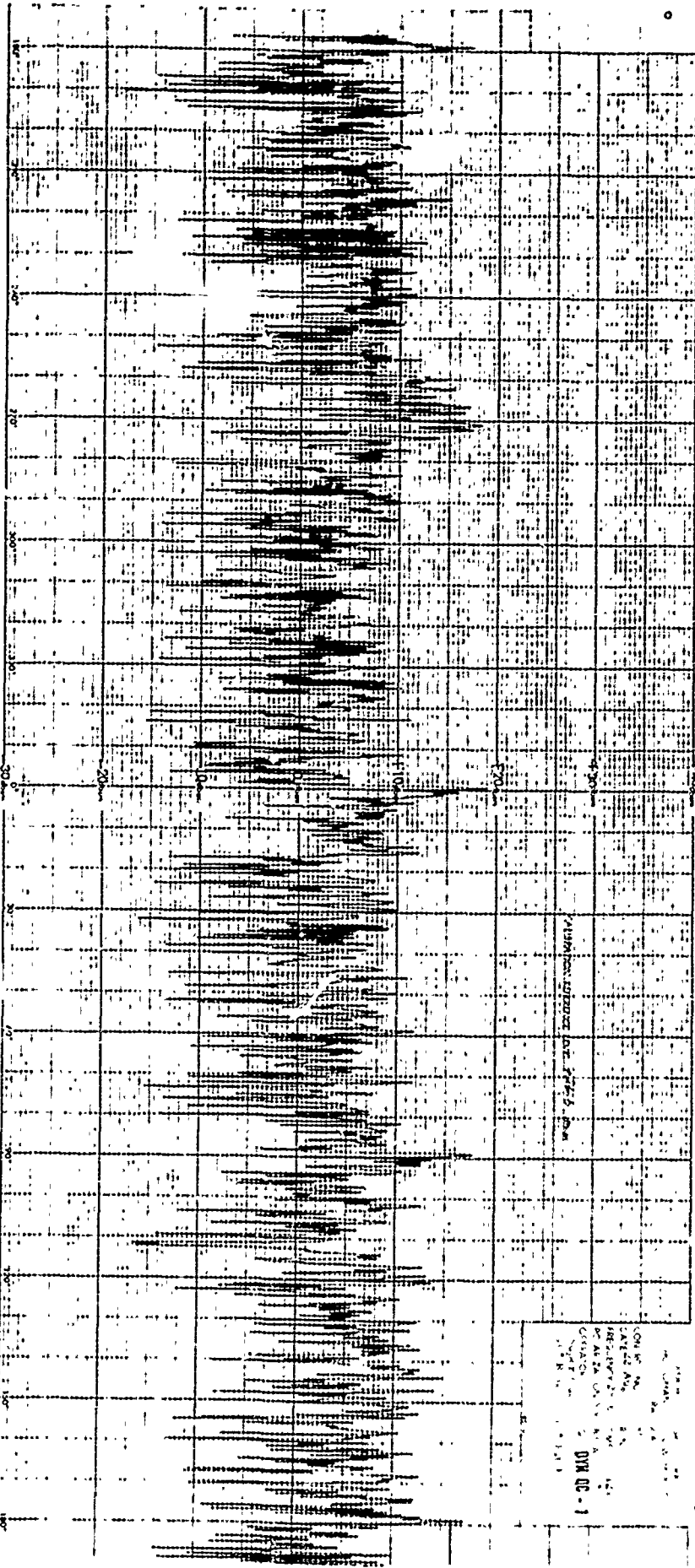


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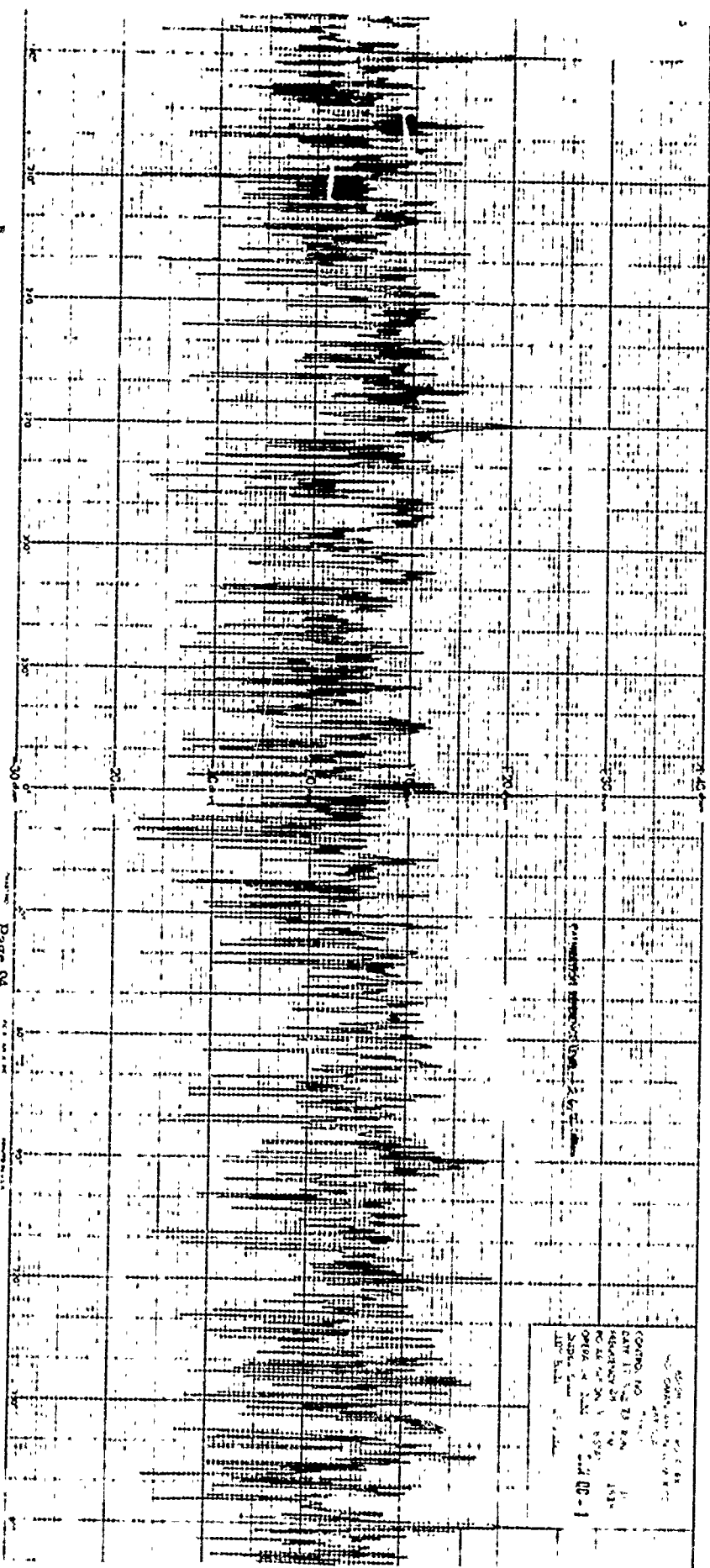




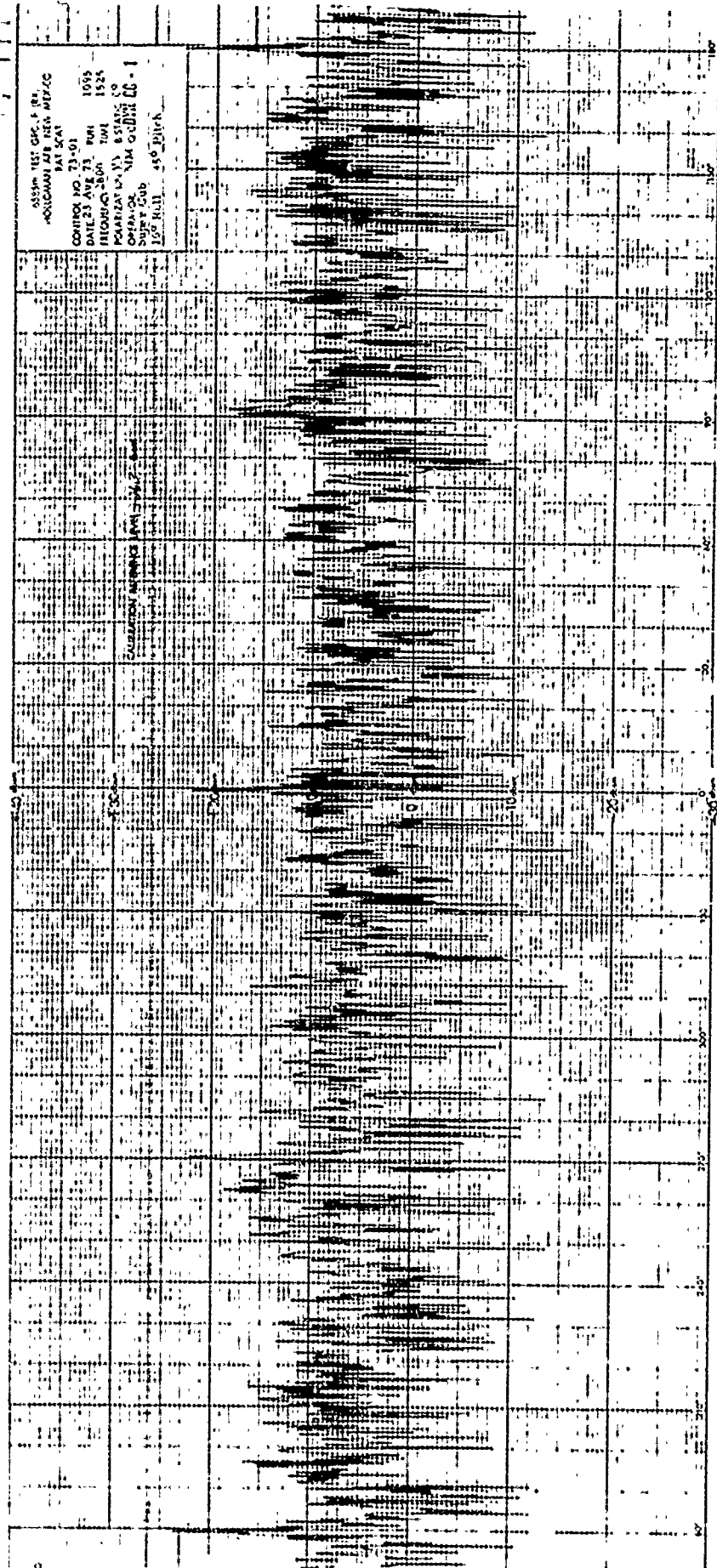




DATA
DATE
TIME
LOCATION
OPERATOR
DYN 10-1

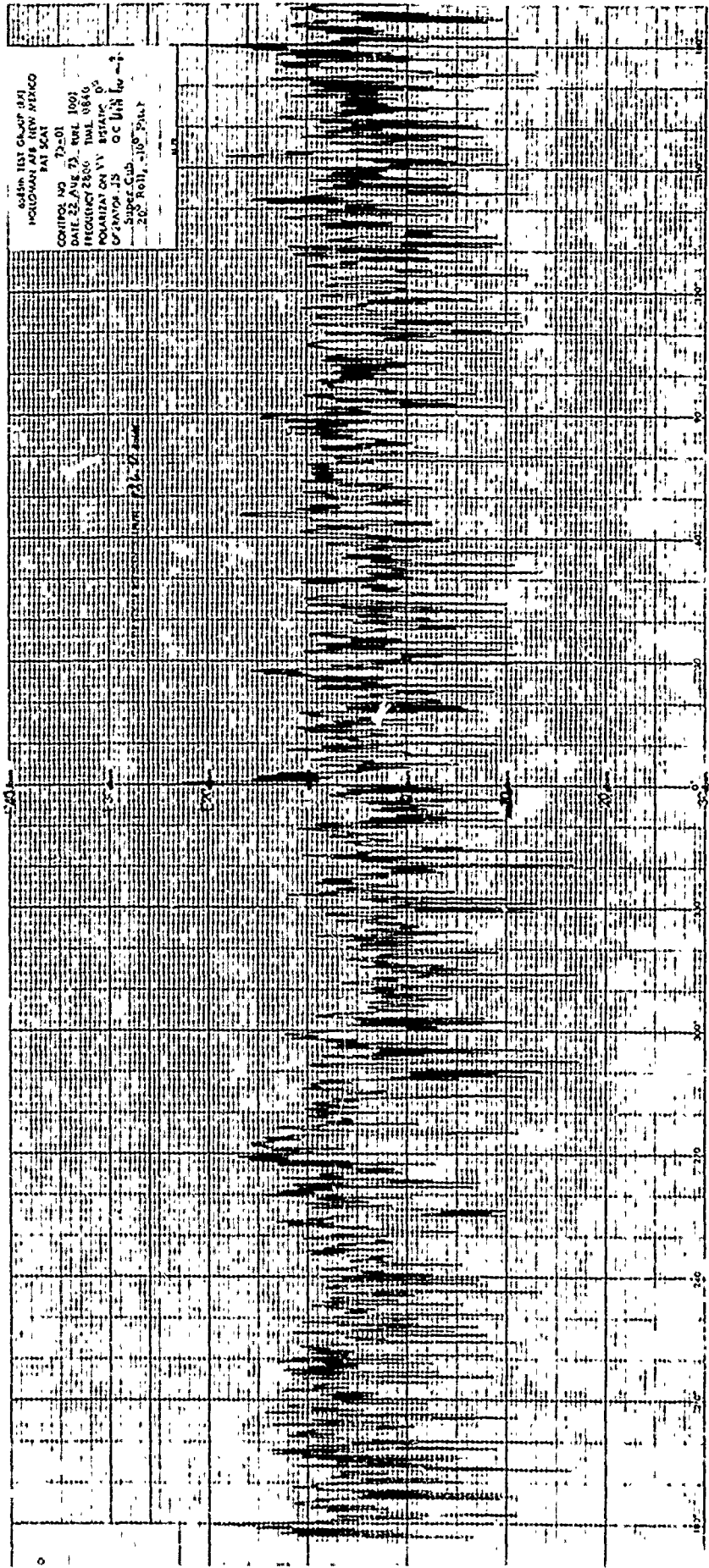


COORD. NO. 1000
DATE 11-12-70
REVISION 1
BY: J. L. B. 1000-1



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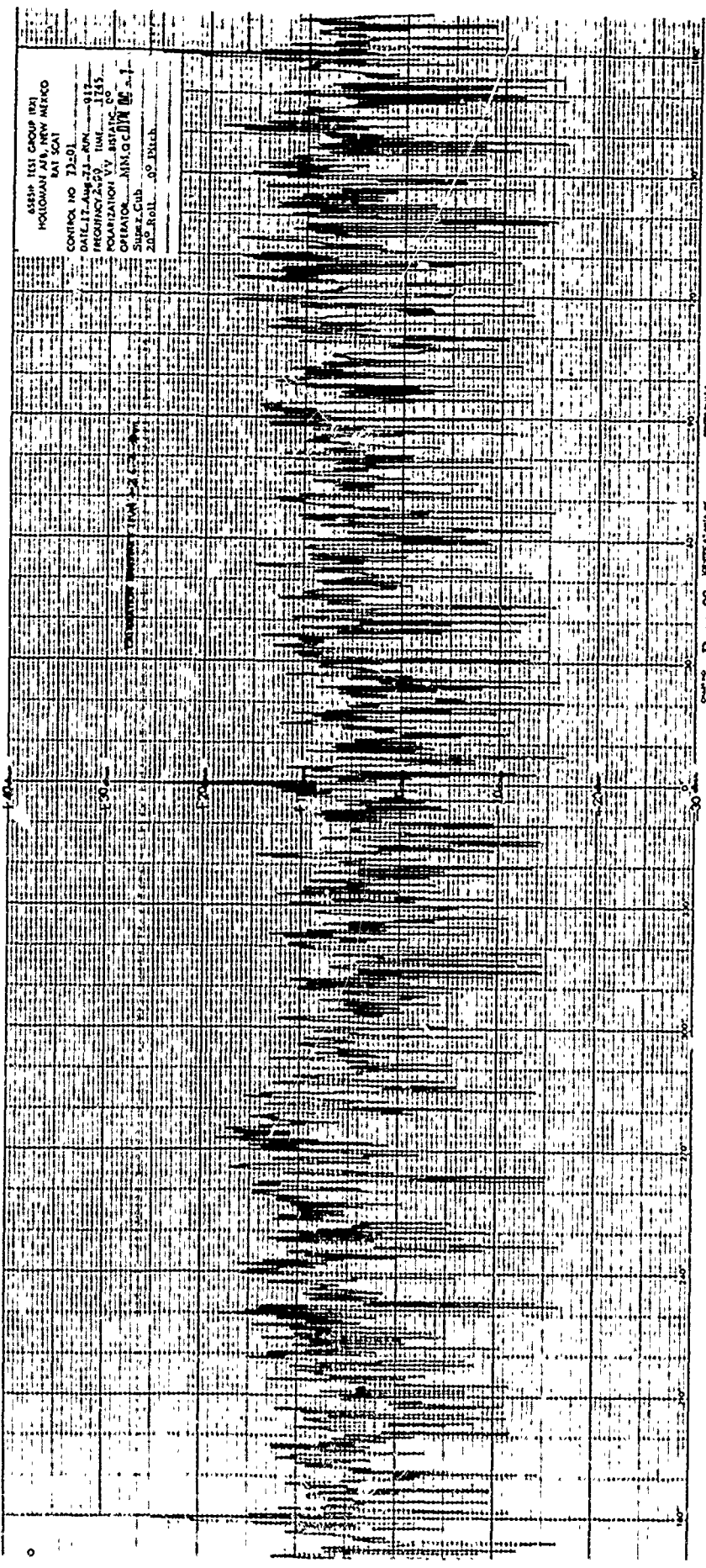
445th TEST GROUP (H)
 HOLLOMAN AFB NEW MEXICO
 PAT SCAT
 CONTROL NO 72-01
 DATE 22 AUG 73 NPL 1001
 FREQUENCY 2800 TIAL 0846
 POLARIZATION VV BISTATIC 95
 OF 2000 JS OC 11N 100
 Super Cub
 20° Roll, 10° Pitch

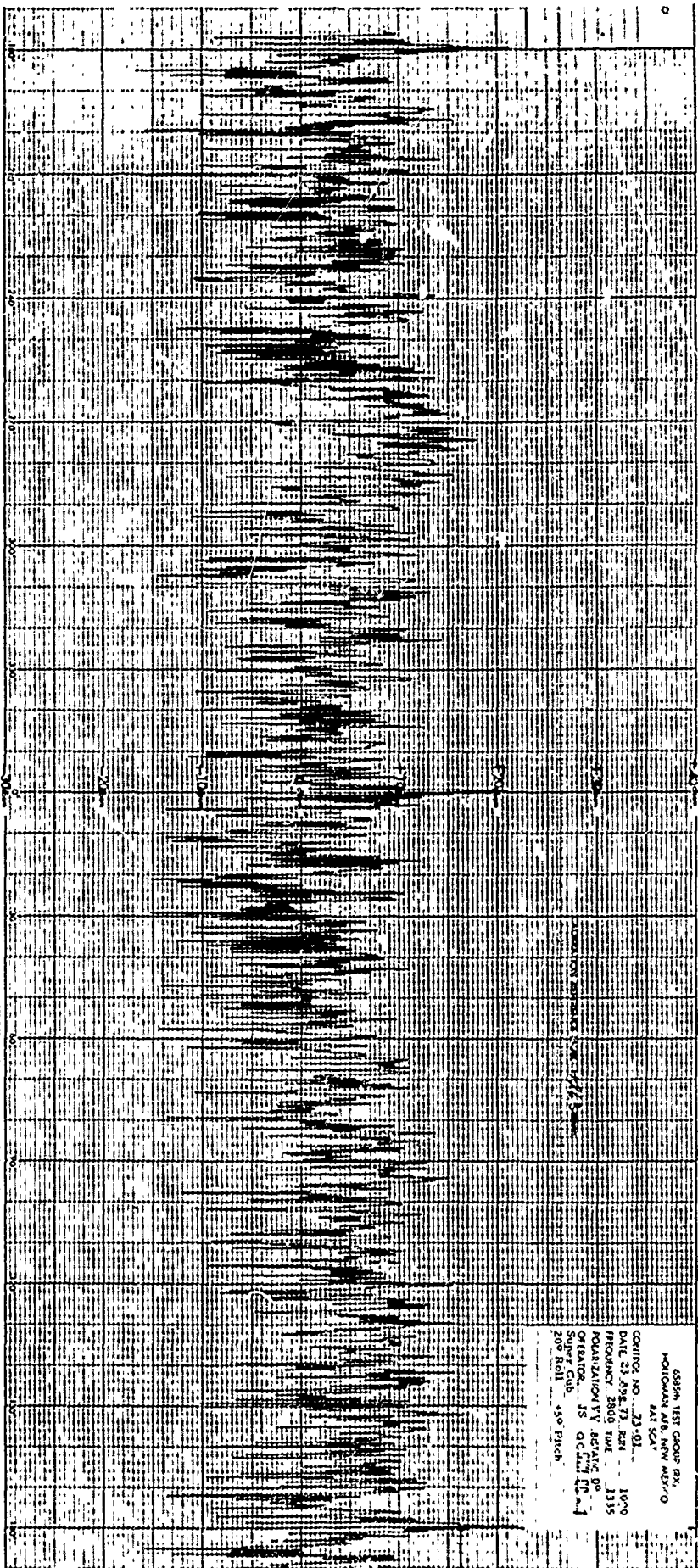


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ASSTA 1ST GROUP (2)
HOLDING IN NEW MEXICO
EAT 501

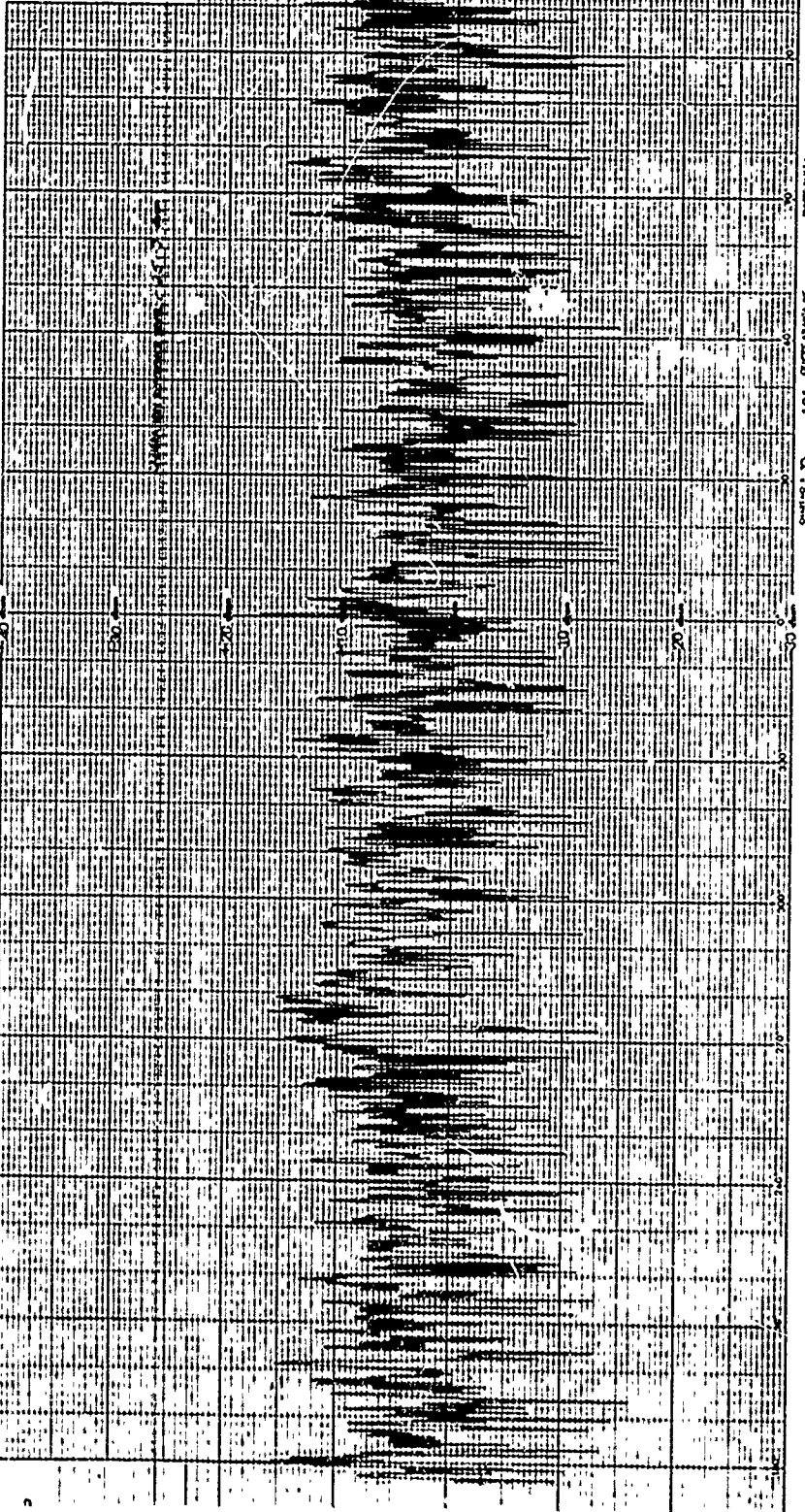
CONTROL NO 11-01
DATE 17-04-01
PRODUCTION VV 017
OPERATOR VV 017
SUPERVISOR VV 017
2nd Roll 00 Ditch

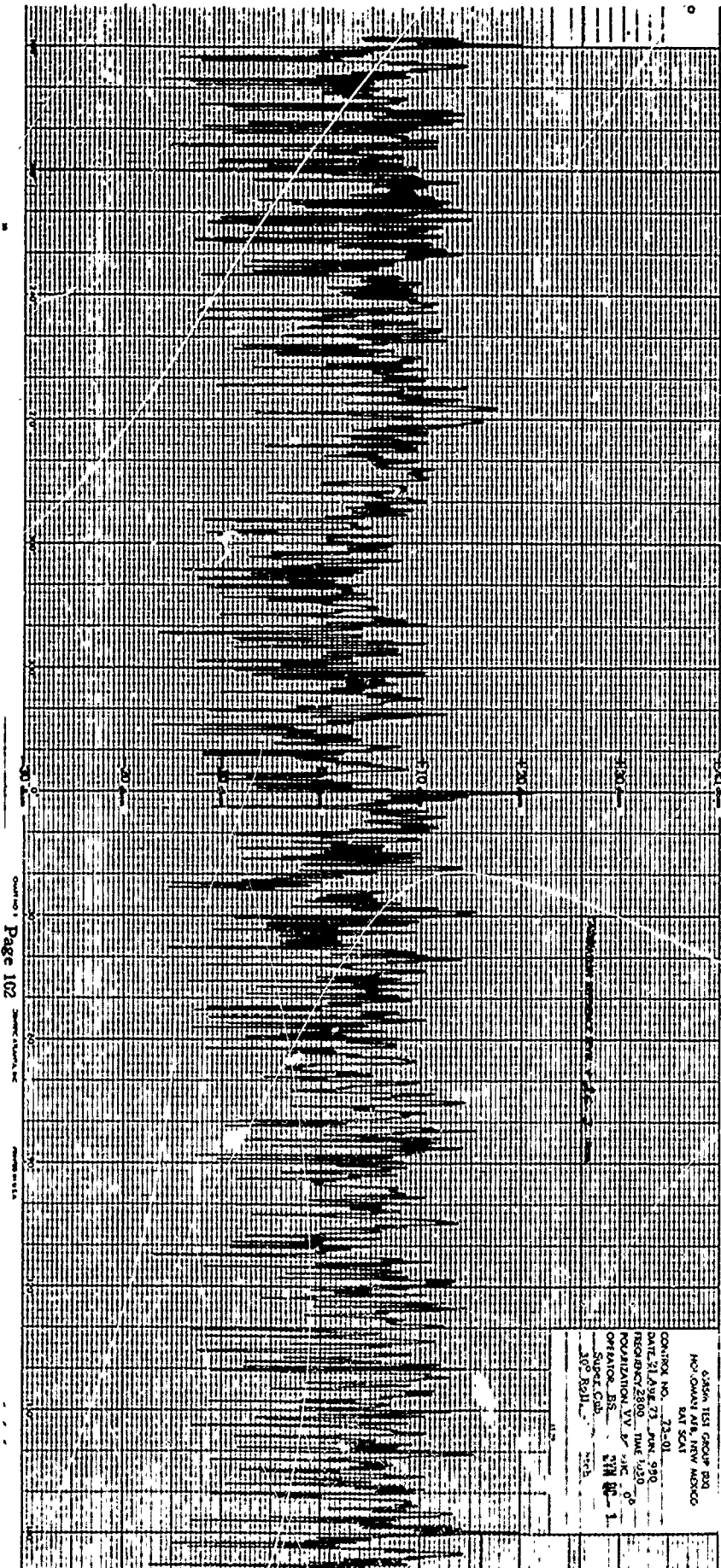




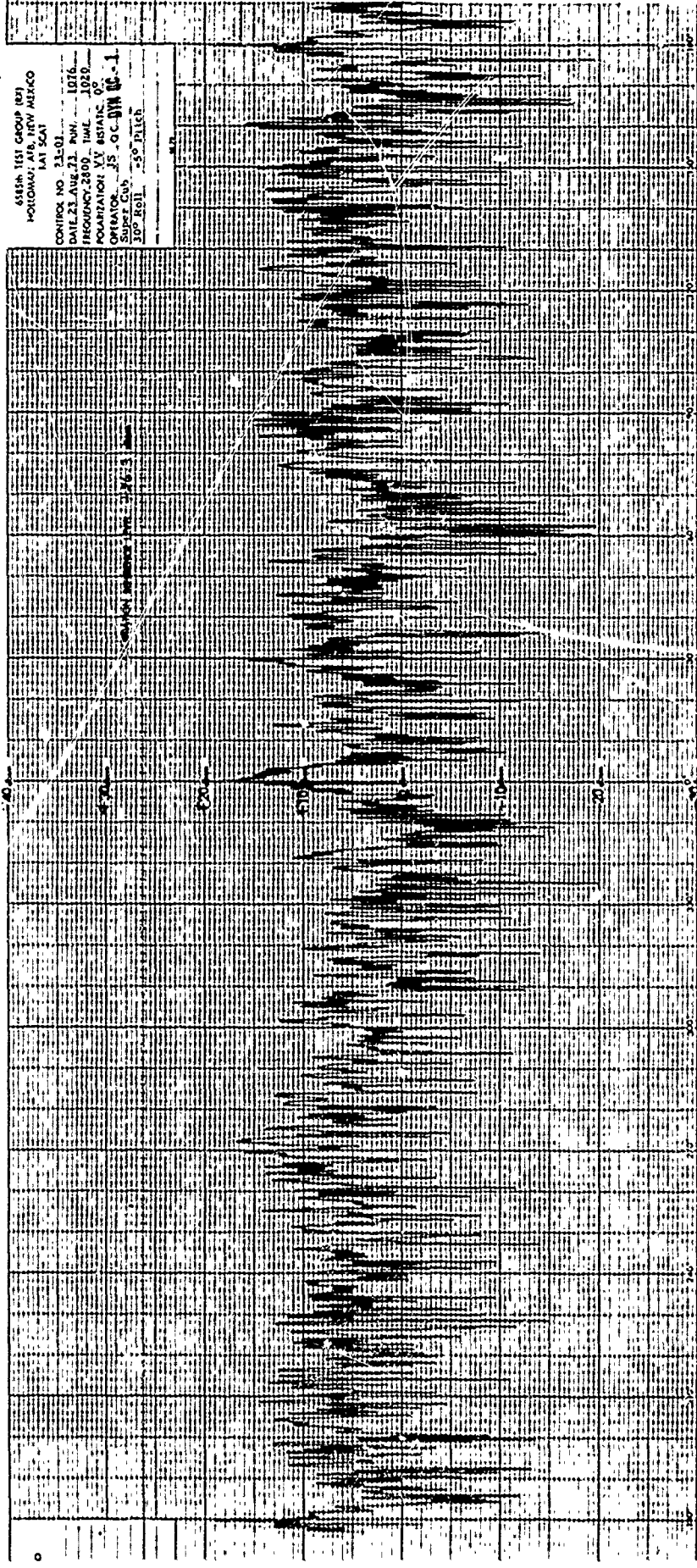
4594A 181 GROSS RX
 HORIZONTAL 148 100V MD/O
 AT 50V
 COUNT NO. 23-01
 DATE 23 Apr 73 1000
 FREQUENCY 2800 Hz 1335
 POLARIZATION VY 102 100
 ORANGE 15 0.000 10
 Super Cub 450 Pich
 200 Roll

4545A TEST GROUP (P3)
HOLLANDIA AIR, NEW MEXICO
BAT SCAT
CONTRACT NO 23-01
DATE: AUG 73 PWL 1153
FREQUENCY: 2850 TIME 1245
POLARIZATION: VV INDIANCO
OPERATOR: JLS-CC JMS 6-1
Super Cub
201 Roll 4101-Plid

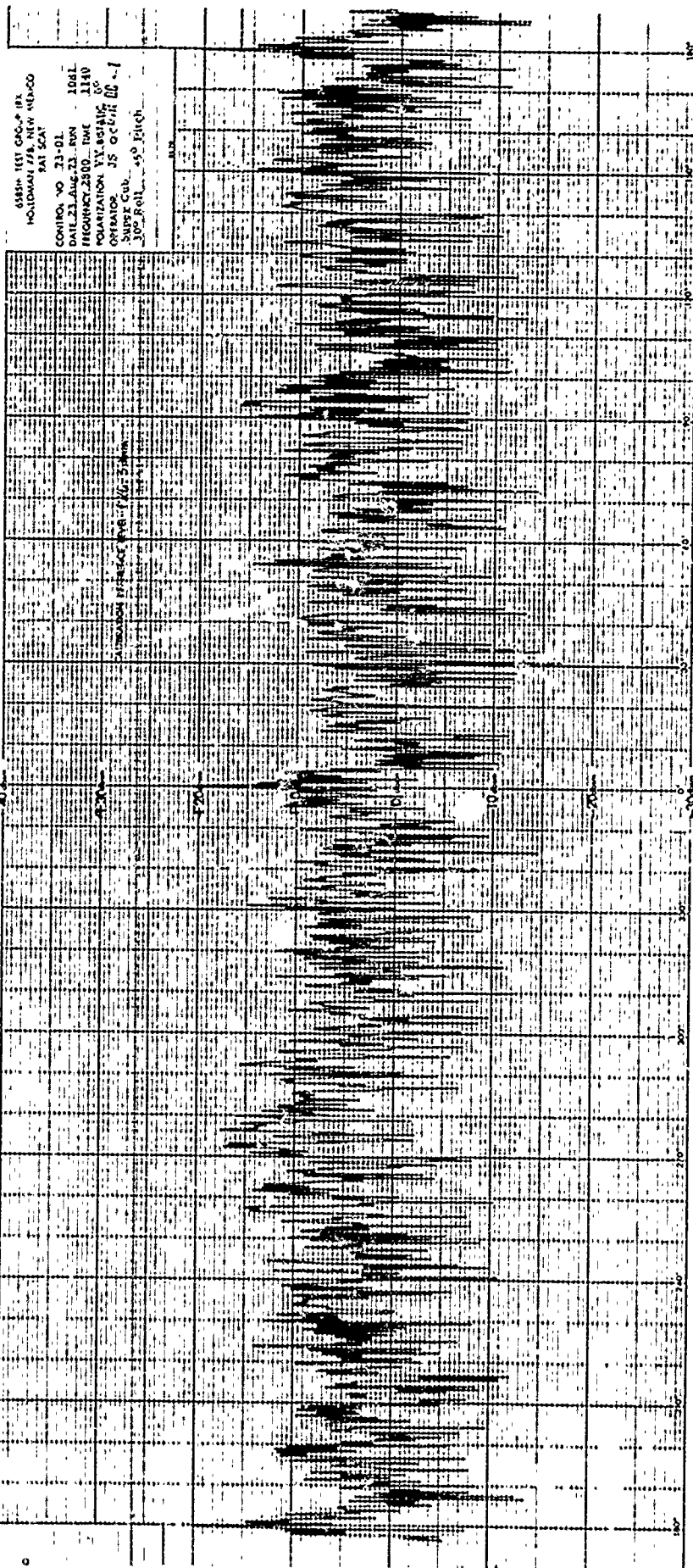


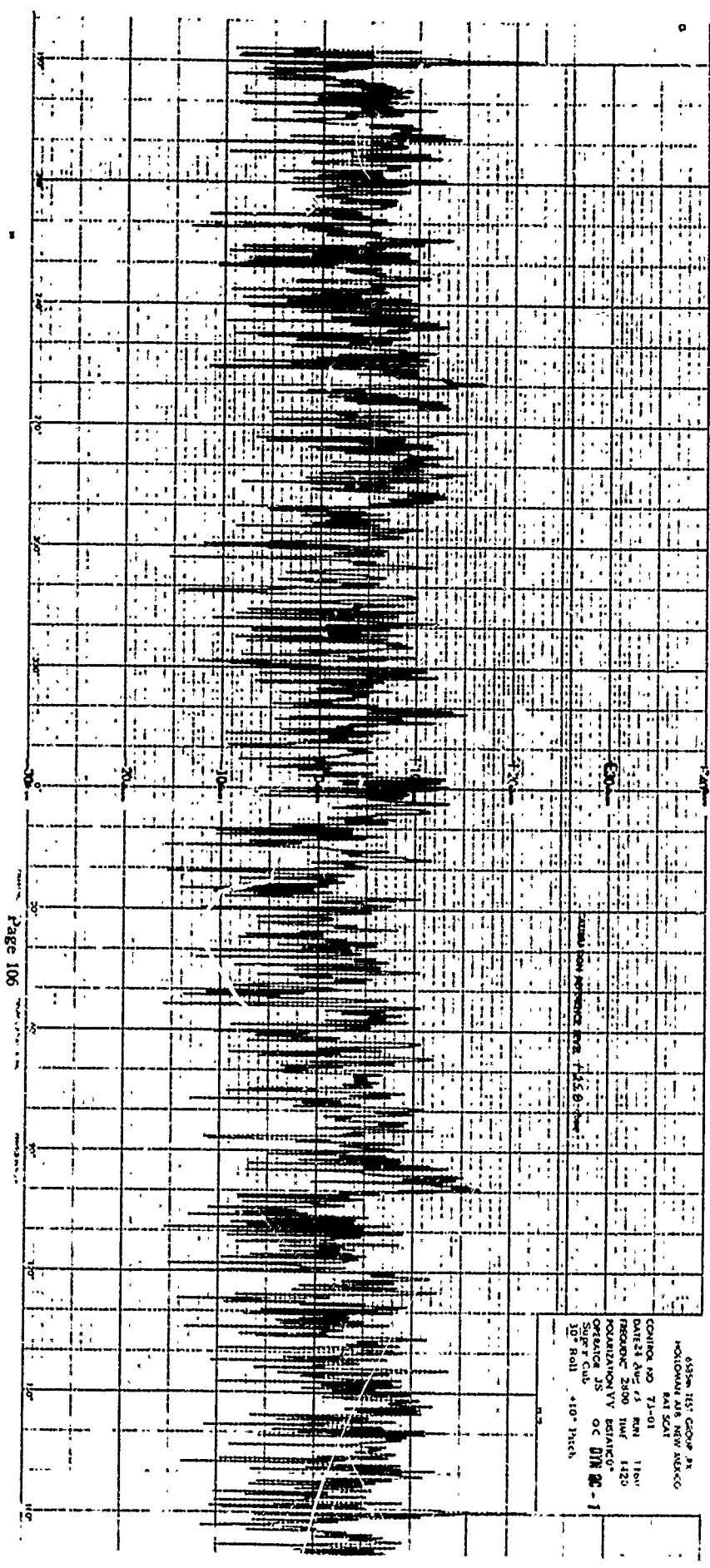


6558H TEST GROUP (B7)
HOLLOMAN, AR, NEW MEXICO
LAT SCAT
CONTROL NO 11-01
DATE 21 AUG 71 RUN 1076
FREQUENCY 2800 TIME 1020
POLARIZATION VV AZIMUTH 0°
OPERATOR JS OC 09N 02-1
Super Cub
10° Roll 5° Pitch

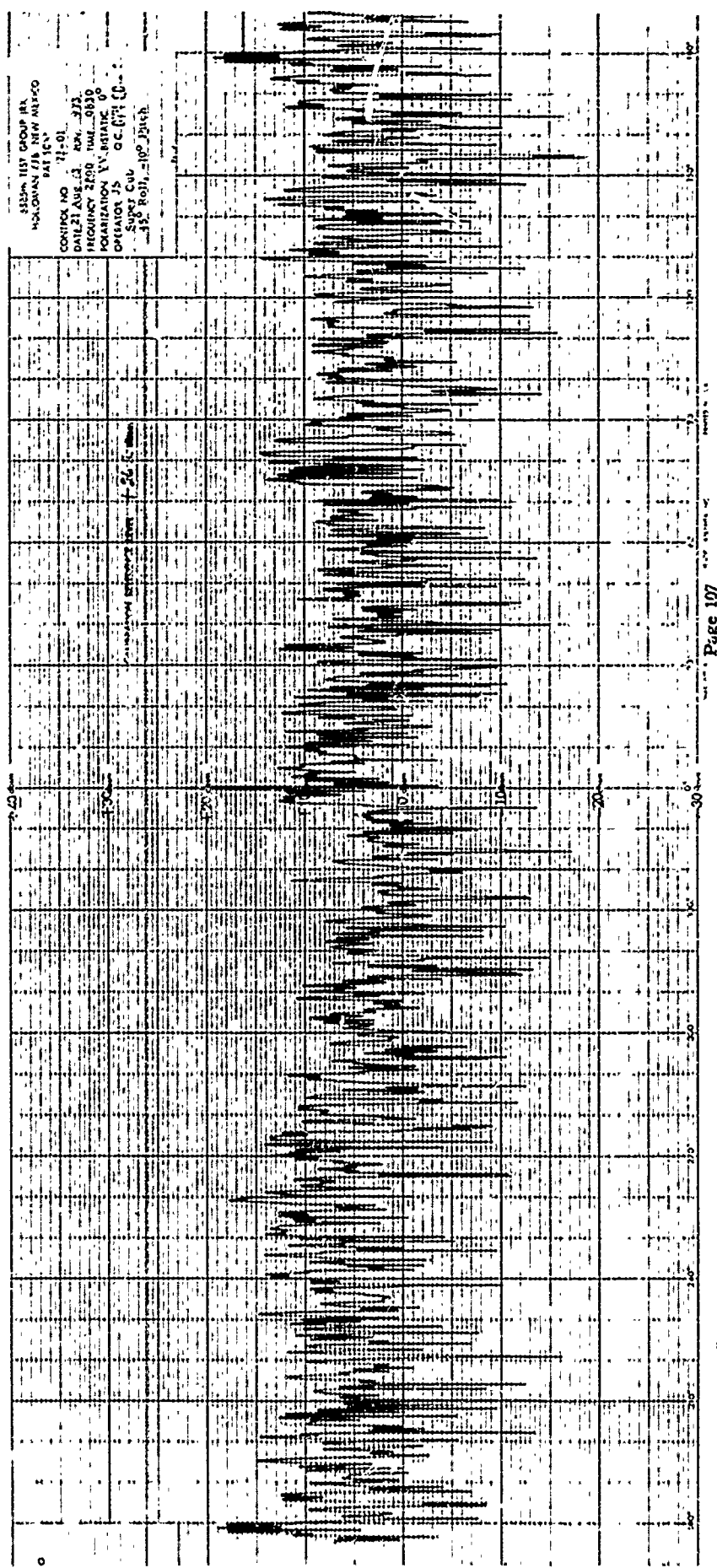


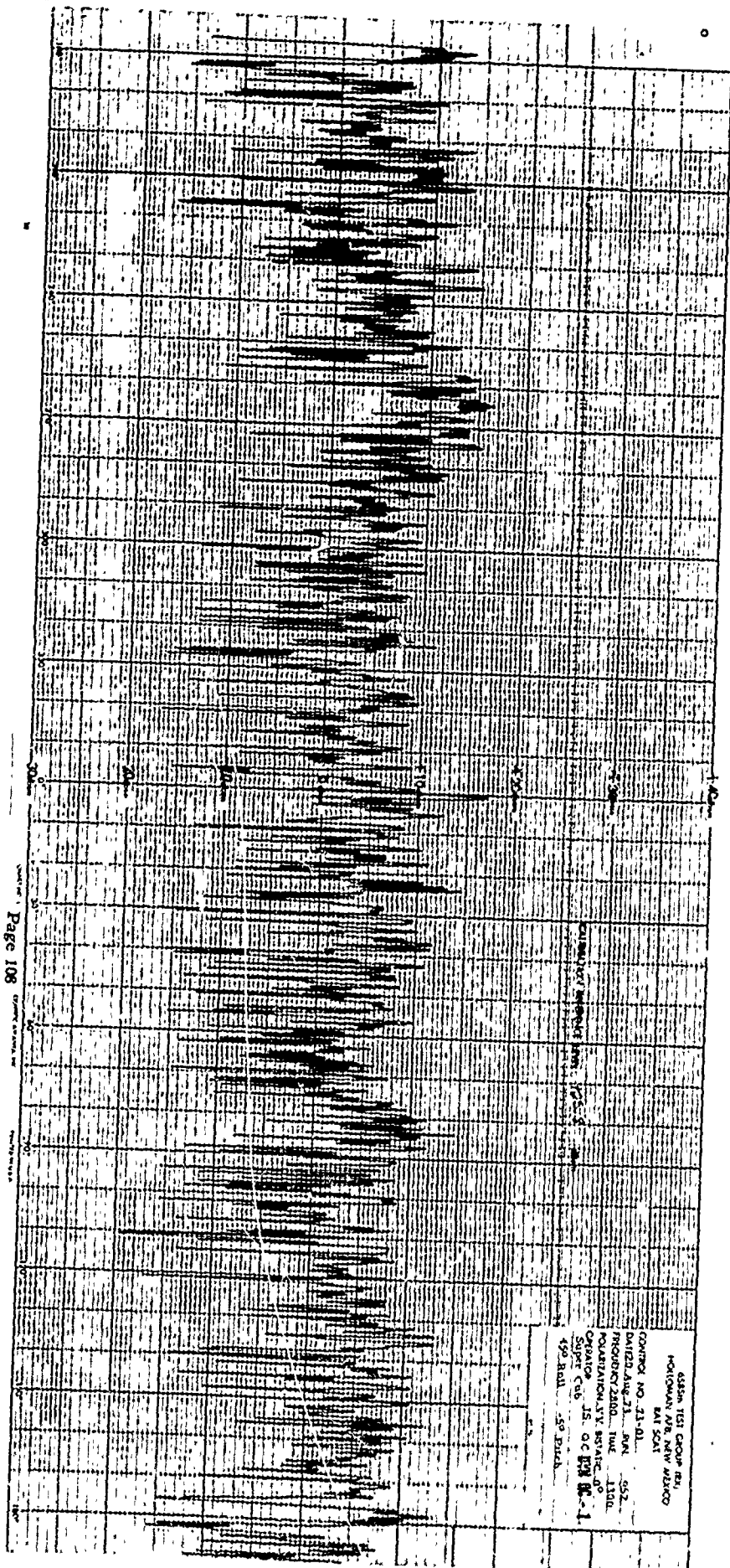
CONFIDENTIAL: Page 104



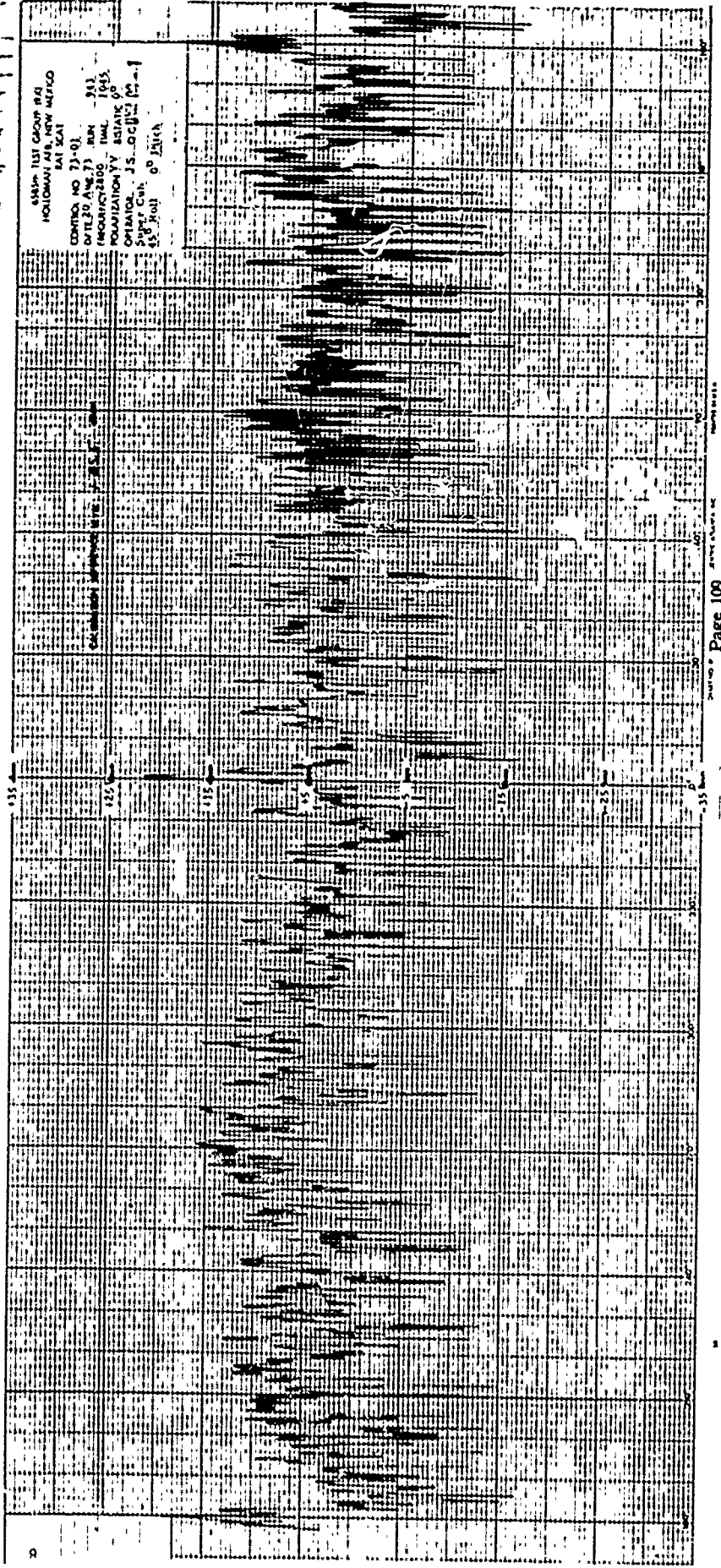


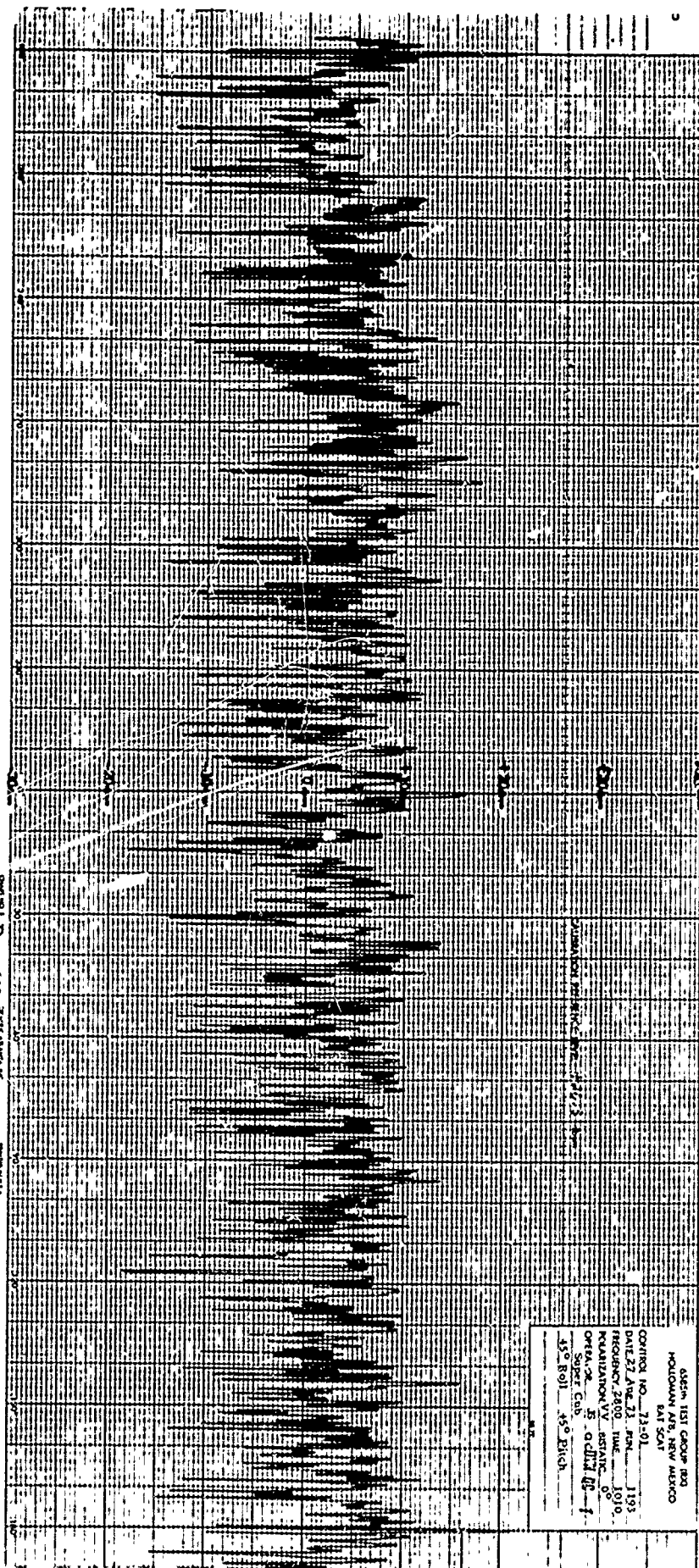
635m 101° GROUP 21
 HORIZONTAL AIR NEW ARKCO
 101 SCOT
 CONTROL NO 71-01
 DATE 24 Aug 45 RUN 1101
 FREQUENCY 2500 SWF 1420
 POLARIZATION VV 834100
 OPERATOR JS OC DM 20-1
 SURF CUB
 10° Roll +10° Pitch



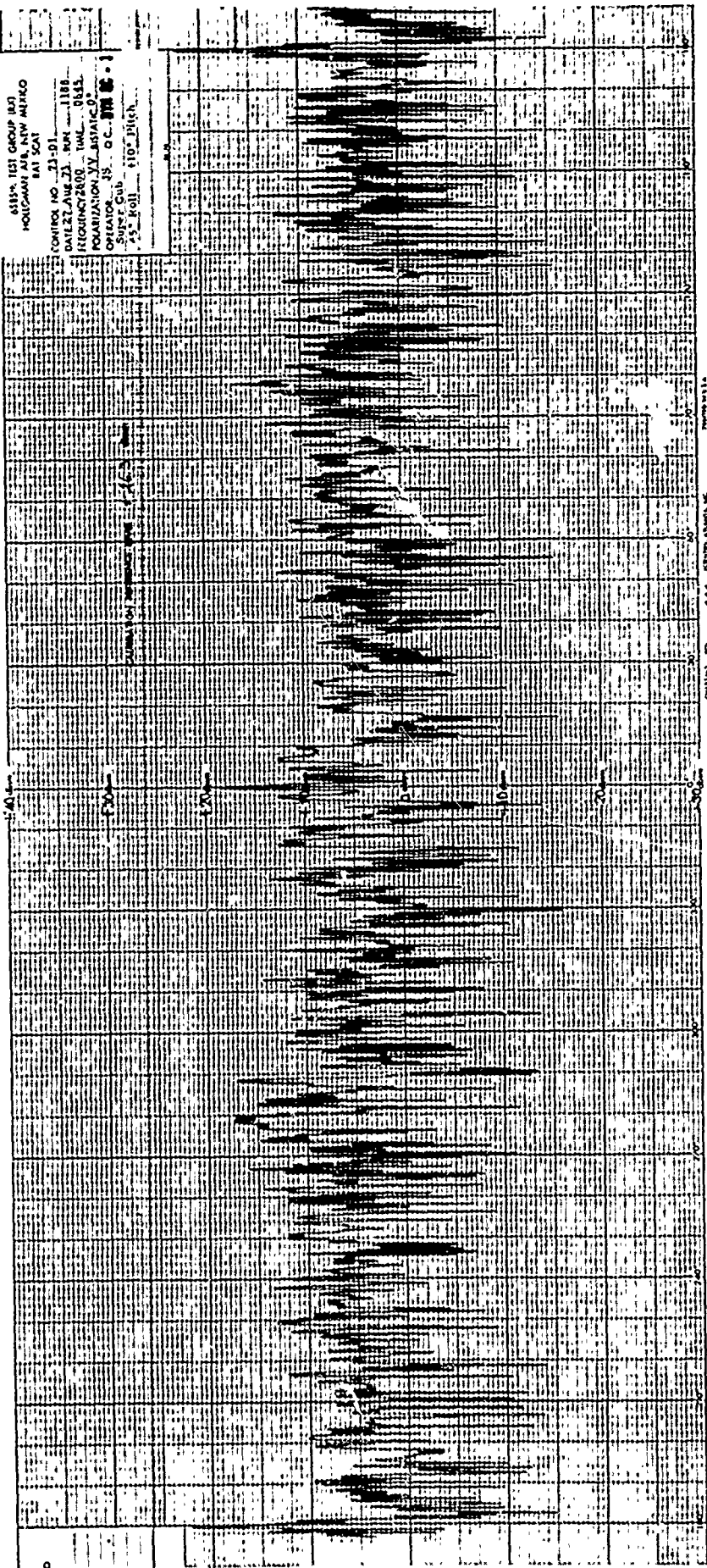


635m TET GROUP E21
HOLLOMAN AFB, NEW MEXICO
LAT 34°11'
LONG 107°21'-01"
DATE 23 AUG 51
PROJECT 2800
POLARIZATION VV
ORBITAL 15.00
SUPER COB
490 BULL 50 DATA





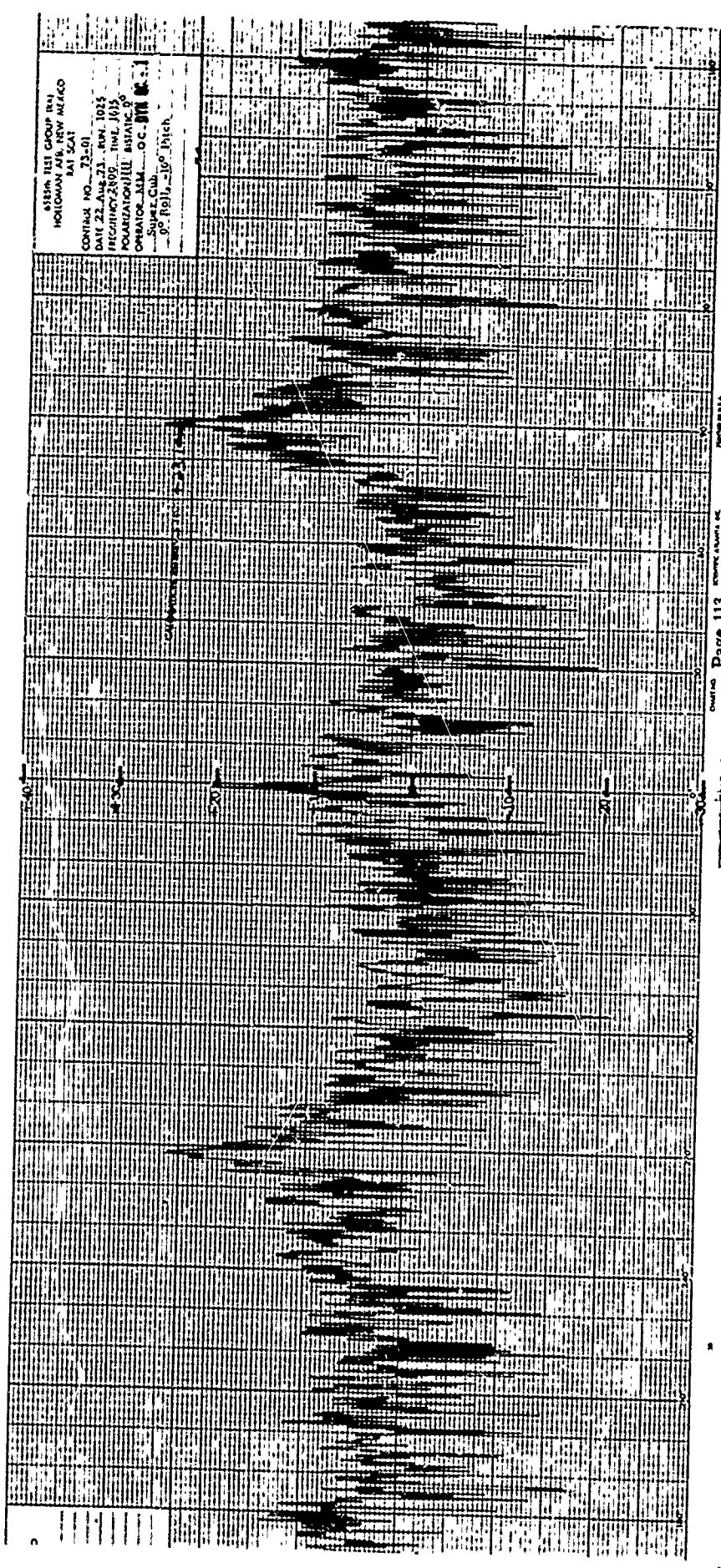
61554 TEST GROUP (A)
 HOLLAND AIR, NEW MEXICO
 1st 501
 CONTROL NO. 21-01
 DATE 27 AUG 21 RUN 1188
 FREQUENCY 2800 TUNE 3543
 POLARIZATION XY - STATICO
 OPERATOR JS - OC. 2188
 Super Club
 25' Roll 110' Pitch

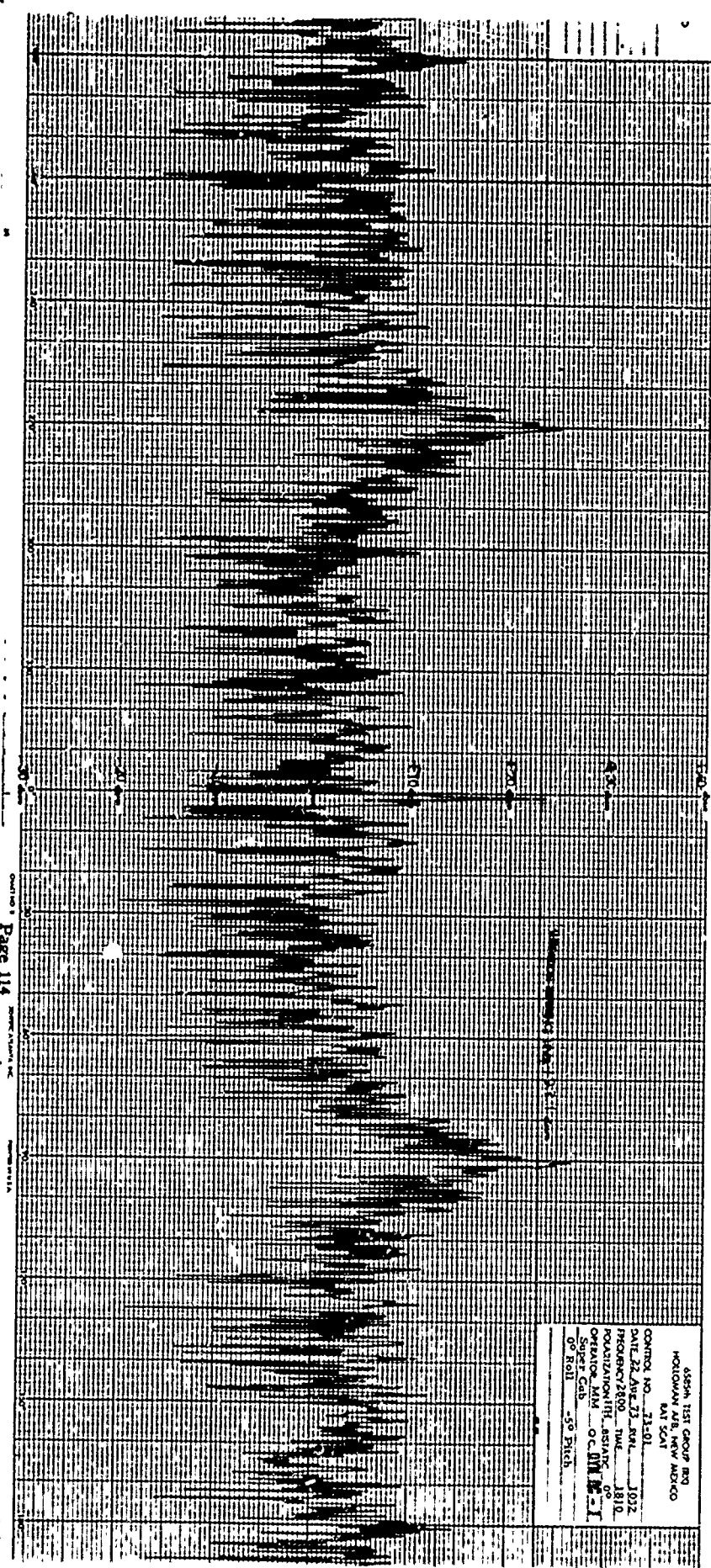


1110000000

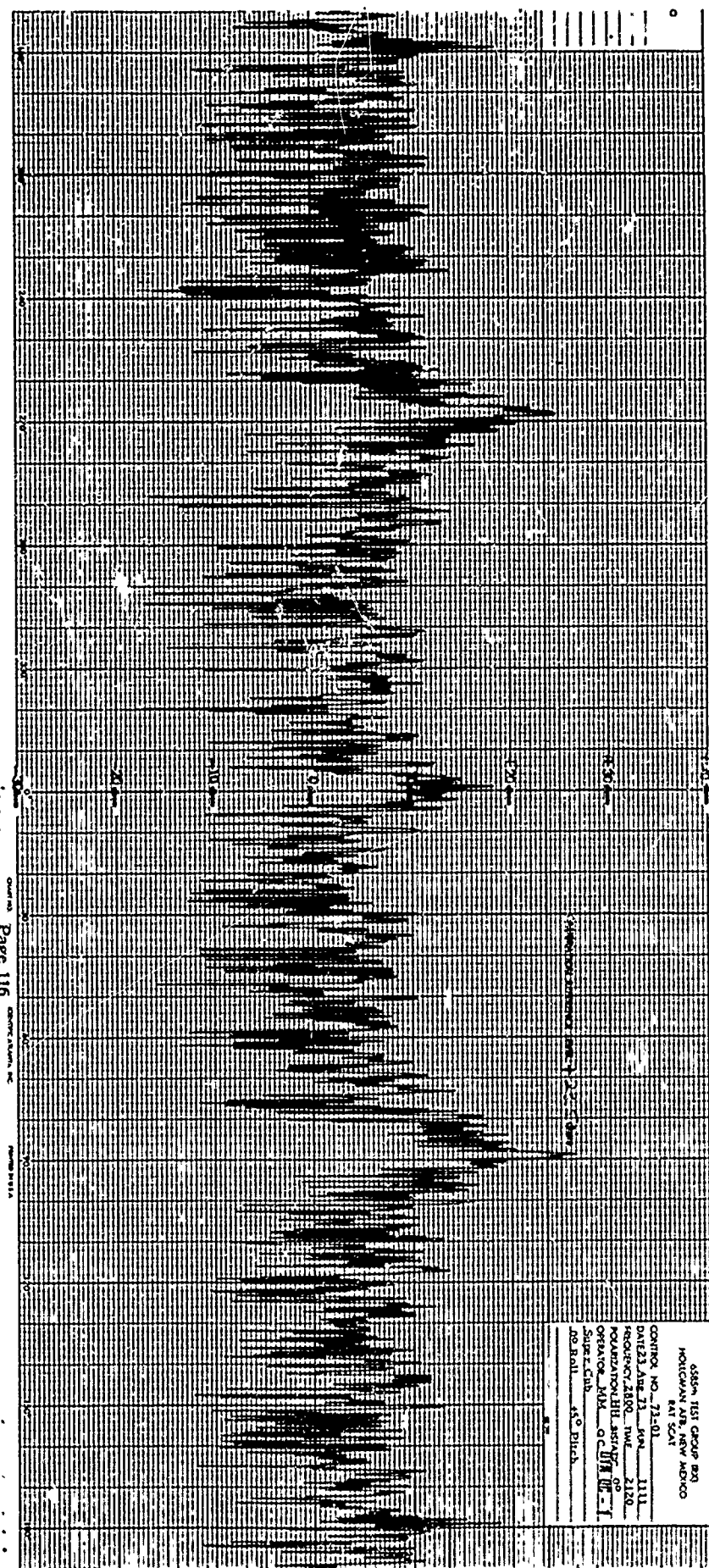
55th TEST GROUP
HOLCOMB AFB, NEW MEXICO
SAT SCAT
CONTROL NO. 71-01
DATE 24 AUG 73 MW 1105
FREQUENCY 2200 MHz 1805
POLARIZATION VV AS 00
OPERATOR JIM GCM
Background
With Columns and Transitions

STEIN TEST GROUP BAY
HOLCOMB AVE. NEW ALBANY
IND. 4601
CONTRACT NO. 73-01
DATE 22 AUG 73. RUN 1015
FREQUENCY 2.805. TIME 1015
POLARIZATION III. BIAS 12.5
OPERATOR JLM. O.C. JRM
SOL. C.W. 9.8919. 210° high.





4554 151 GROUP BQ
 HOLLOWAY
 BAI 501
 CONTROL NO. 21-501
 DATE 22/11/75, 1002
 FREQUENCY 1810, 1810
 LOCALIZATION, 1810
 ORIGIN, 1810
 OF 1810 - 50 Pitch



6885m TEST GROUP 800
HOLCOMB AIR, NEW MEXICO
RAI SCAT
CONTROL NO. 72-01
DATE 23 APR 54 RUN 1111
FREQUENCY 2800 TIME 2120
POLARIZATION LH ASY 0°
OPERATOR MM O C 07M 07-1
SHIP C. Club 45° Pitch
NO ROLL

GREEN 1ST GROUP (B)
HOLDING AREA NEW MEXICO
AT SCAT

CONTROL NO. 21-01

DATE 21 AUG 71

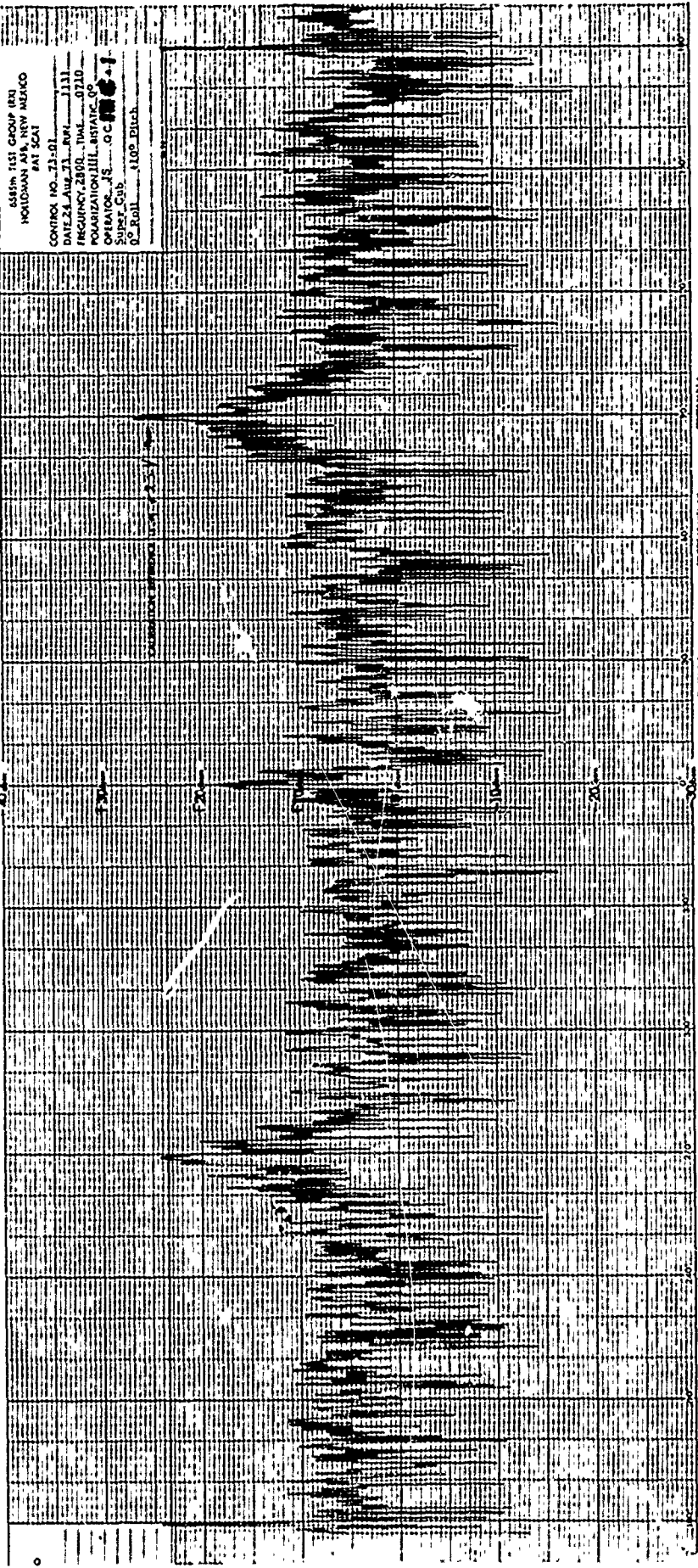
REGIMENT 2100

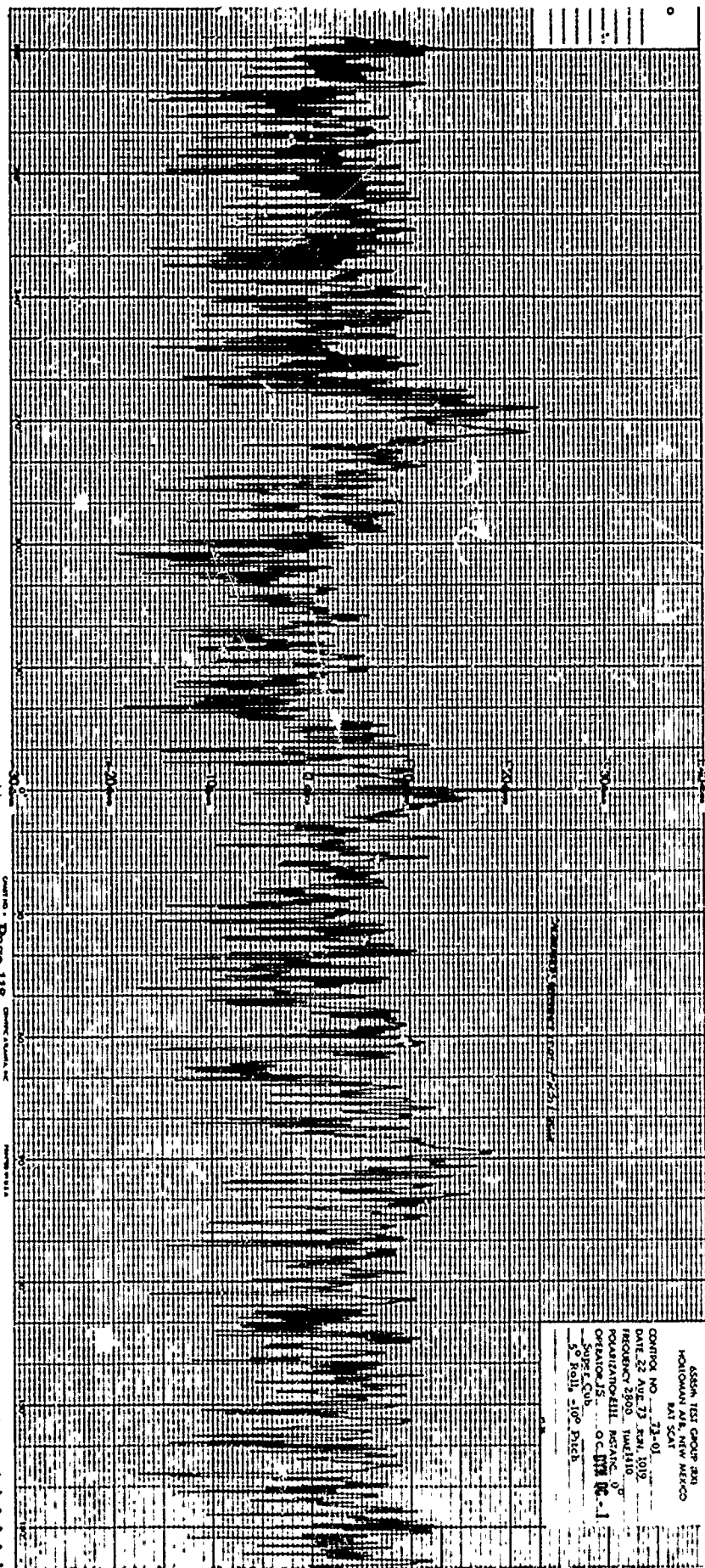
ORGANIZATION 1111

OPERATION 0210

SPEC. CODE 00000000

00000000



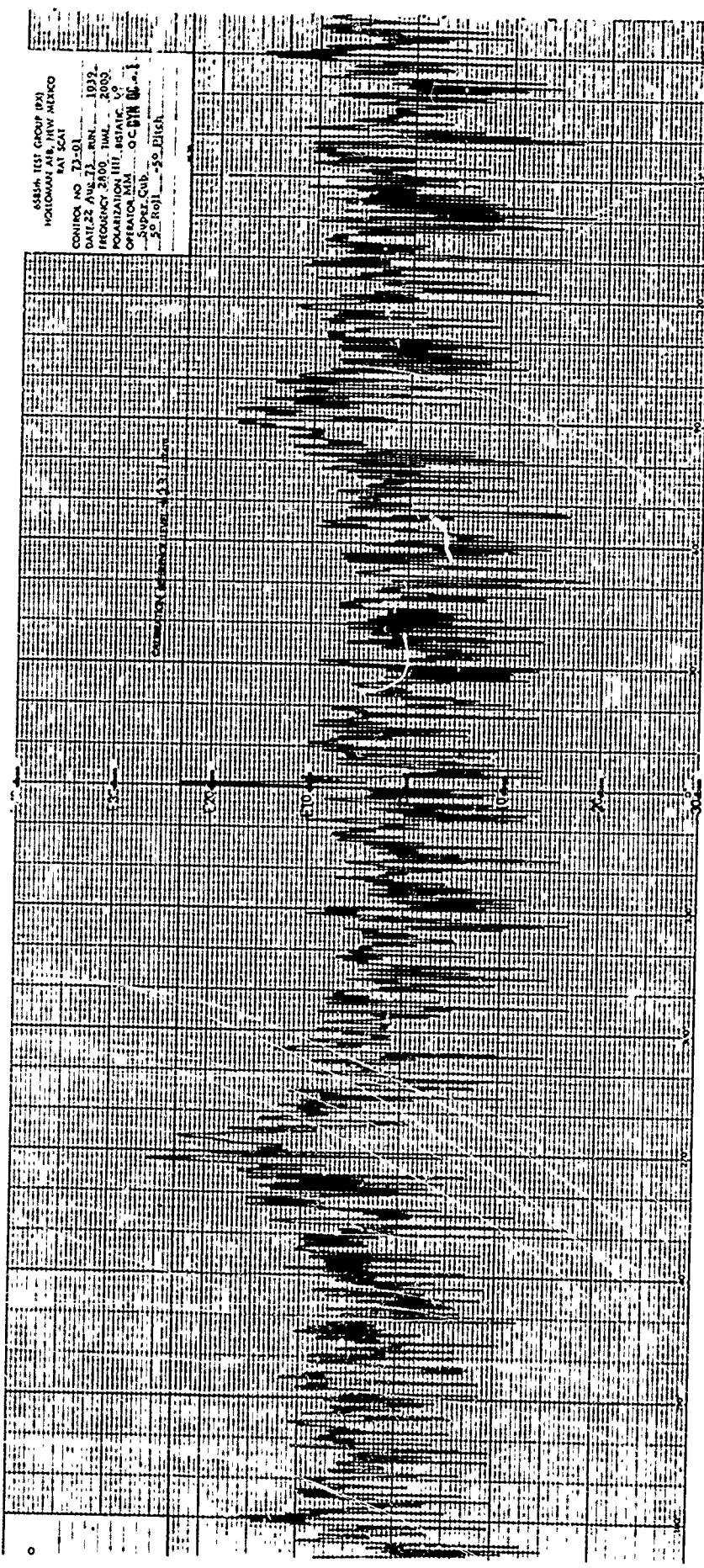


ASSAULT TEST GROUP 201
 HOLLOWAY AT NEW MEXICO
 10/10/10
 CONTING NO. 12-01
 DATE 22 JUL 10 1010
 FREQUENCY 2500 101010
 POLARIZATION 0°
 ORIENTATION 0°
 OPERATOR 15 00 1010 1010
 1010 1010 1010 1010
 1010 1010 1010 1010

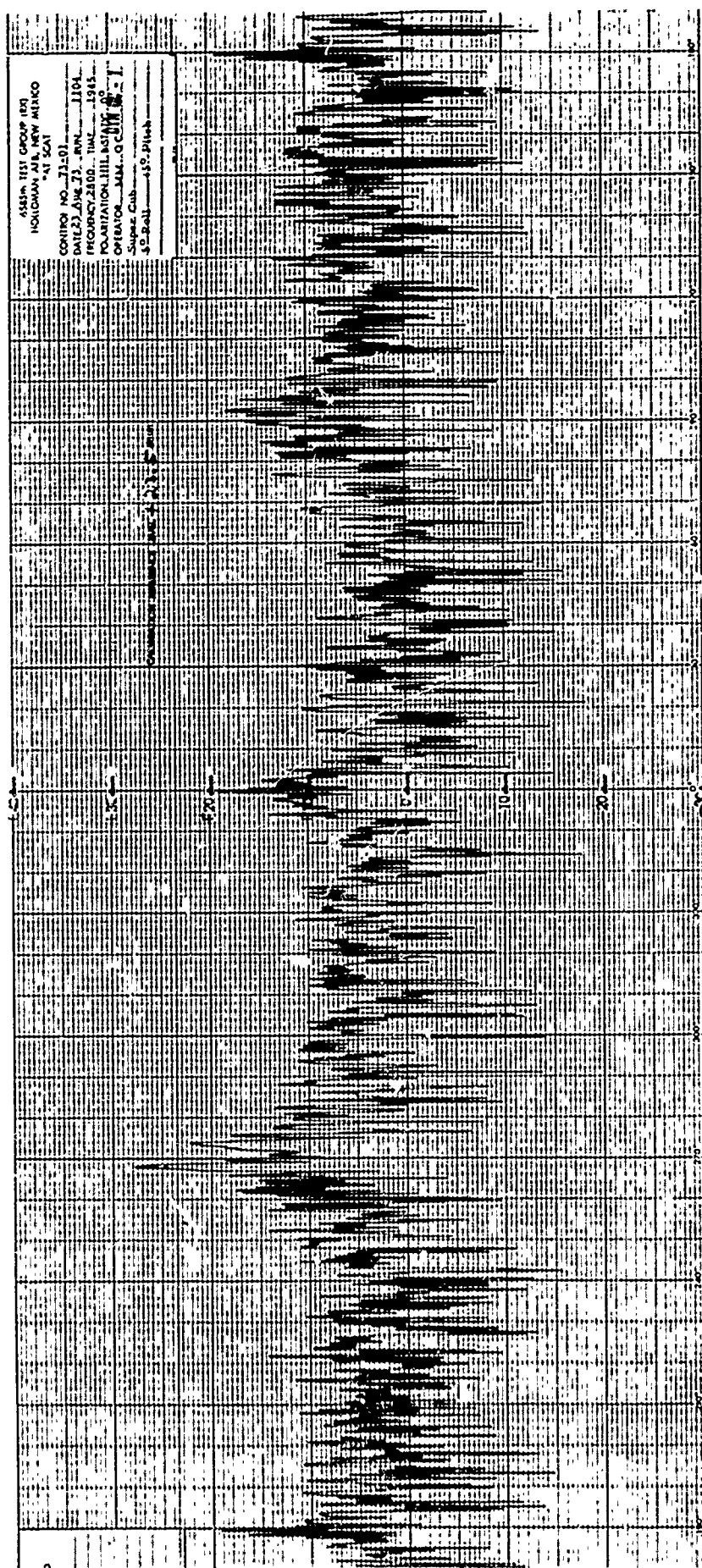
ASST. TEST GROUP 191
HOLCOMB AFB, NEW MEXICO
RAT SCAT

CONTROL NO 73-01
DATE 22 AUG 73
FREQUENCY 2400 MHz
POLARIZATION III, BEAMIC V
OPERATOR MM
Super Cub
50 ftol - 50 ftol

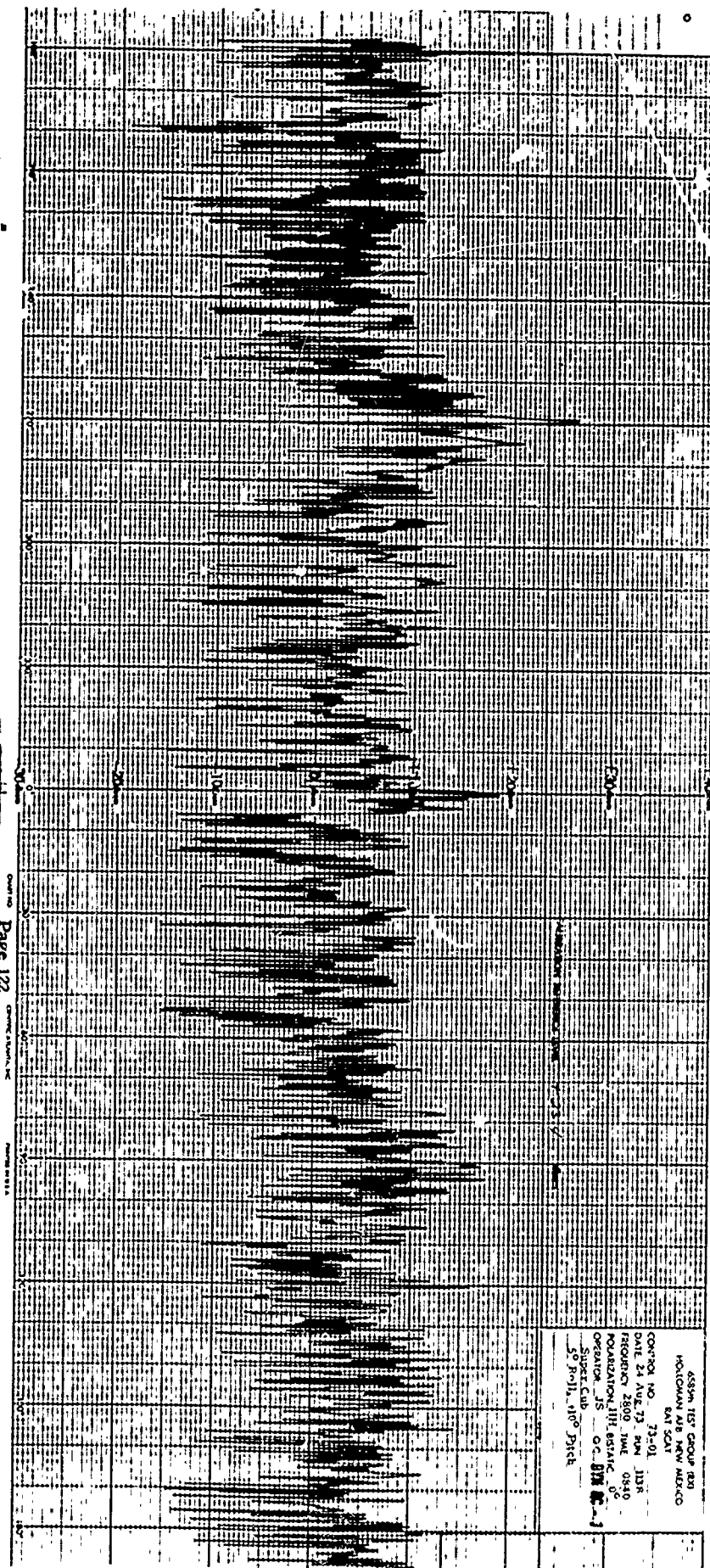
ORIENTATION (EAST) 100°

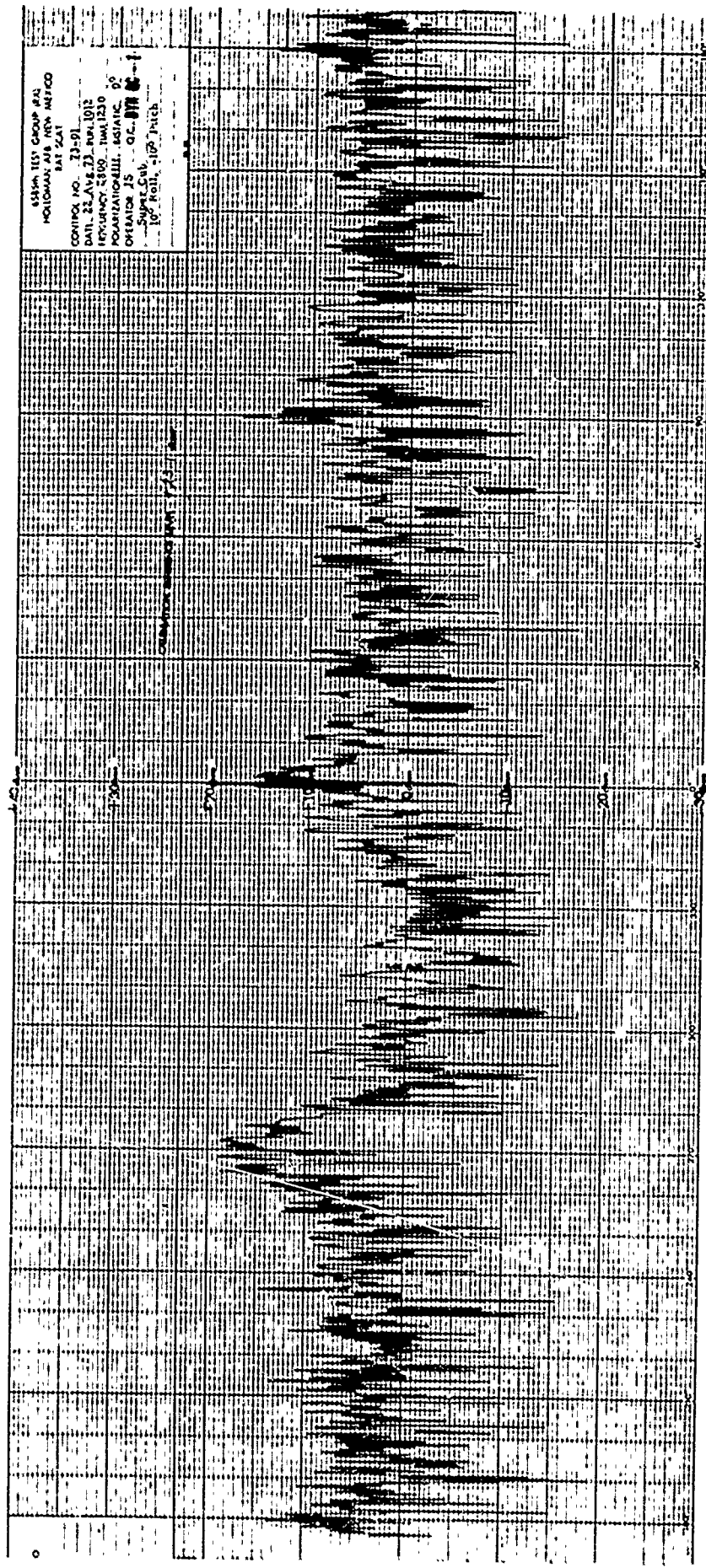


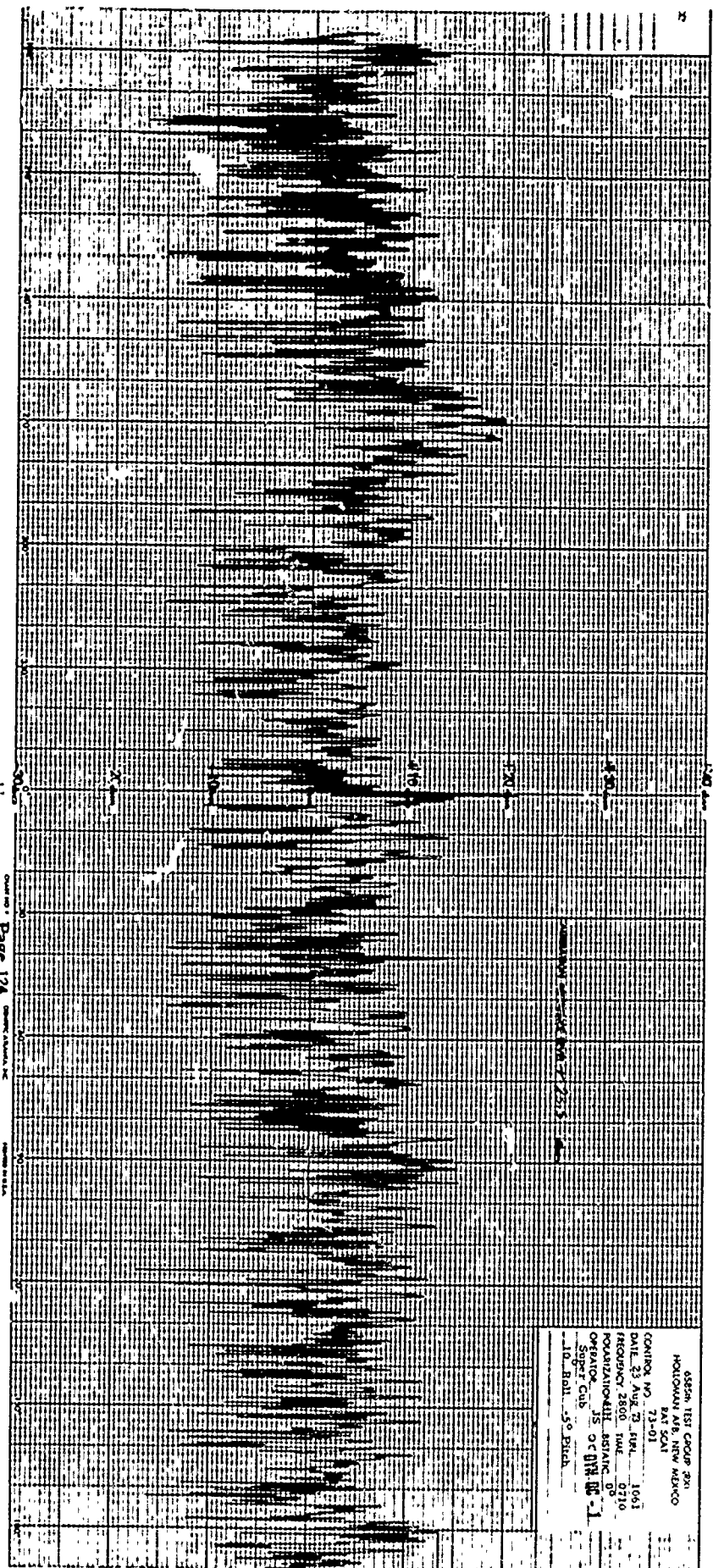
6554A 151 GROUP 870
HOLLOMAN AFB, NEW MEXICO
FBI SCAT
CONTRACT NO 73-01
O. R. LIZARD 11 62N 902
RECORDING 2800 TUE 1245
REMARKS: (H) ASIAN
OFFICER JR. OC 11M 86-1
Super Cub
50 Roll 00 Pitch



555th TEST GROUP (UD)
HOLDMAN, JIM, NEW MEXICO
41 SCAT
CONTROL NO. 71-01
DATE 22 JUN 73, RUN 1104
FREQUENCY 2800, TIME 1945
POLARIZATION 1111, 1111
OPERATOR JIM, O. C. 1111
Supers. Cub
50 Ball 450, Pitch





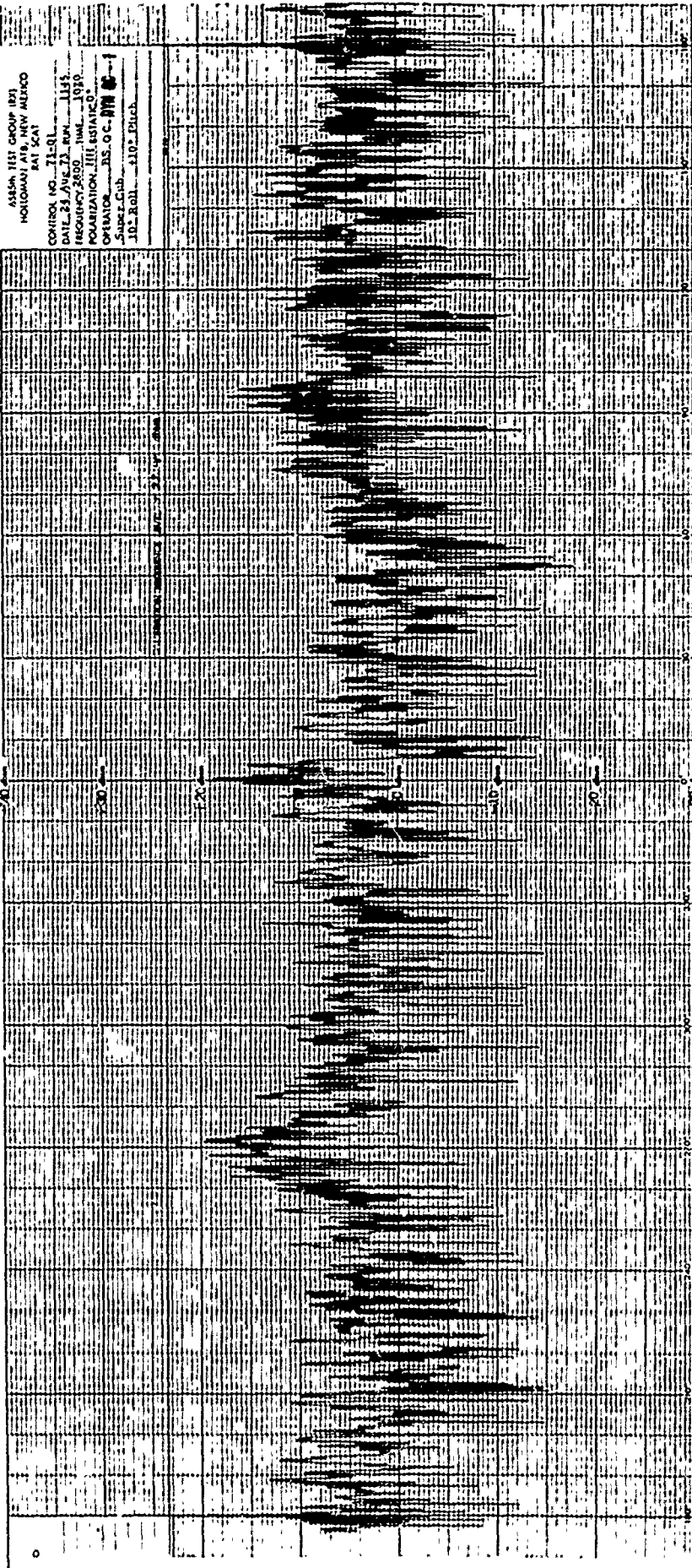


6828th TEST GROUP 301
 HOLCOMB AFB, NEW MEXICO
 7-1-01
 CONTROL NO. 7-1-01
 DATE 23 AUG 73 FRI. 1961
 FREQUENCY 2800. 104E 0710
 ORGANIZATION 451ST AIRCRAFT
 OPERATOR 45 OCT 0710
 Super Club
 10. Roll. -30 Pitch

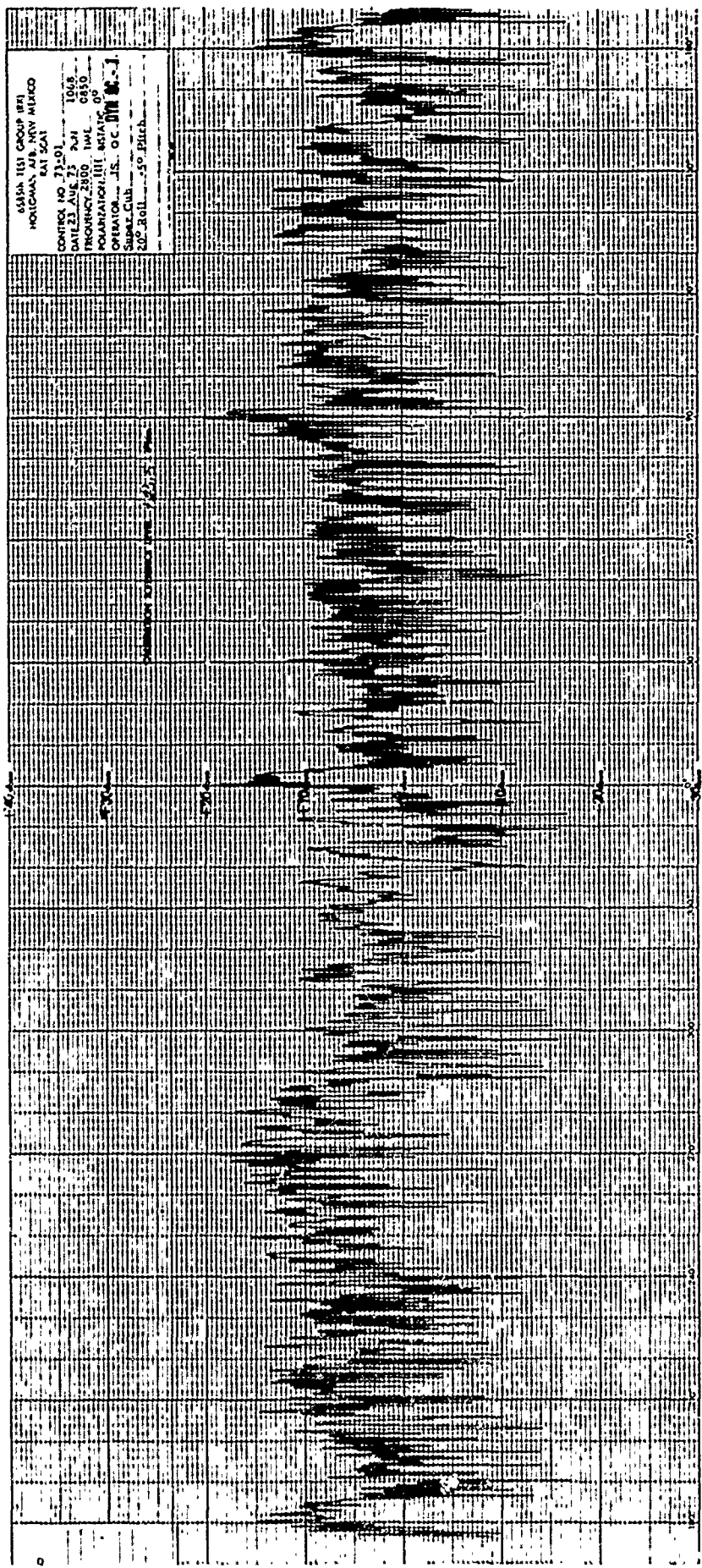
indicated by a significant increase in the number of

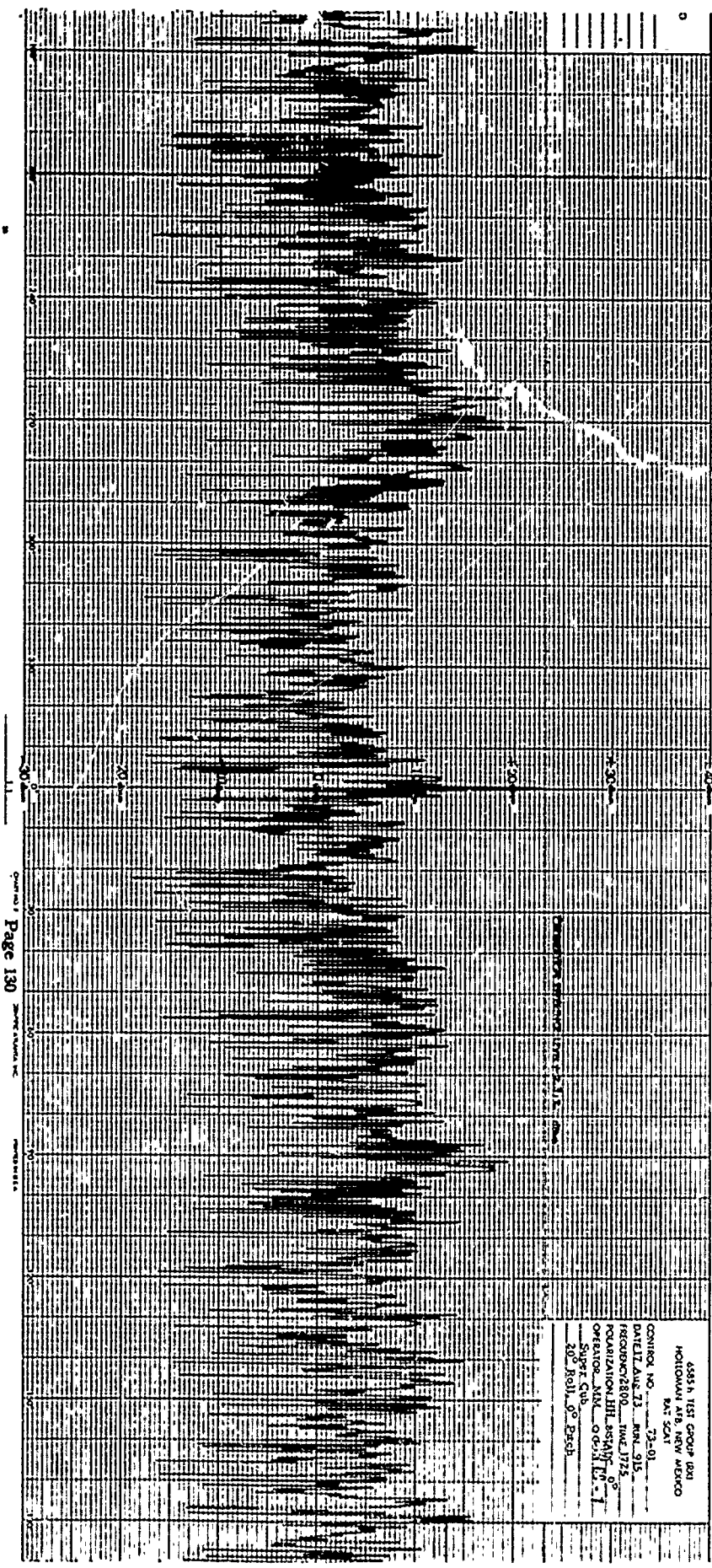
Page 126

ASSEN TEST GROUP 127
HOLLOMAN AFB, NEW MEXICO
RAT SCAT
CONTROL NO. 71-01
DATE 24 Aug 73 RMC 1145
FREQUENCY 2800 MHz 1970
POLARIZATION LITE ESTAB 0°
OPERATOR BS. O.C. JN 0-1
Super. Club 110° Patch
10° Roll 110° Patch

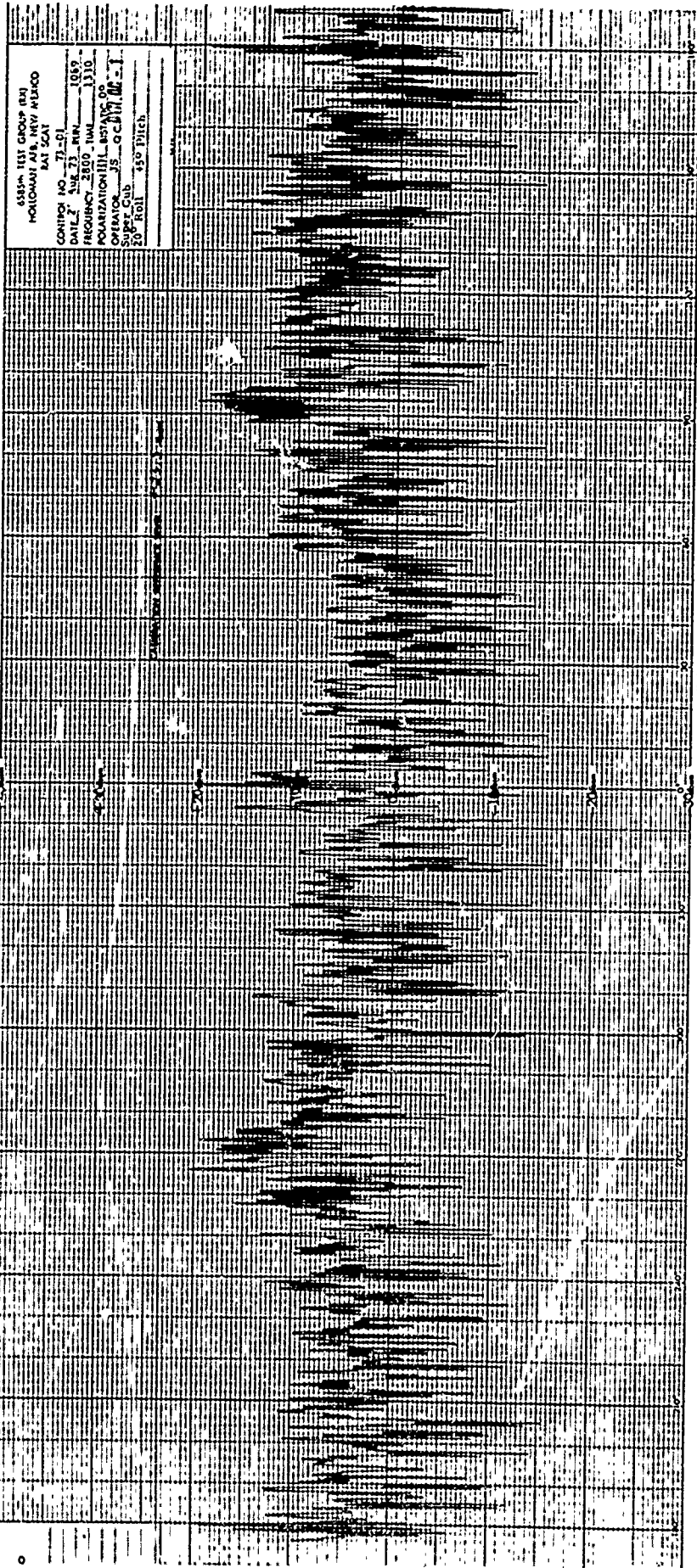


4545, TEST GROUP 831
HOLLOMAN AB, NEW MEXICO
FBI SCAT
CONTING NO. 73-01
DATE 22 Aug 73 RAY 1002
HOURS 2800 TIME 0950
OPERATOR JHE ASTING 05
OPERATOR JS OC DTR 06-1
Super Club
200 Roll, 100 Ditch

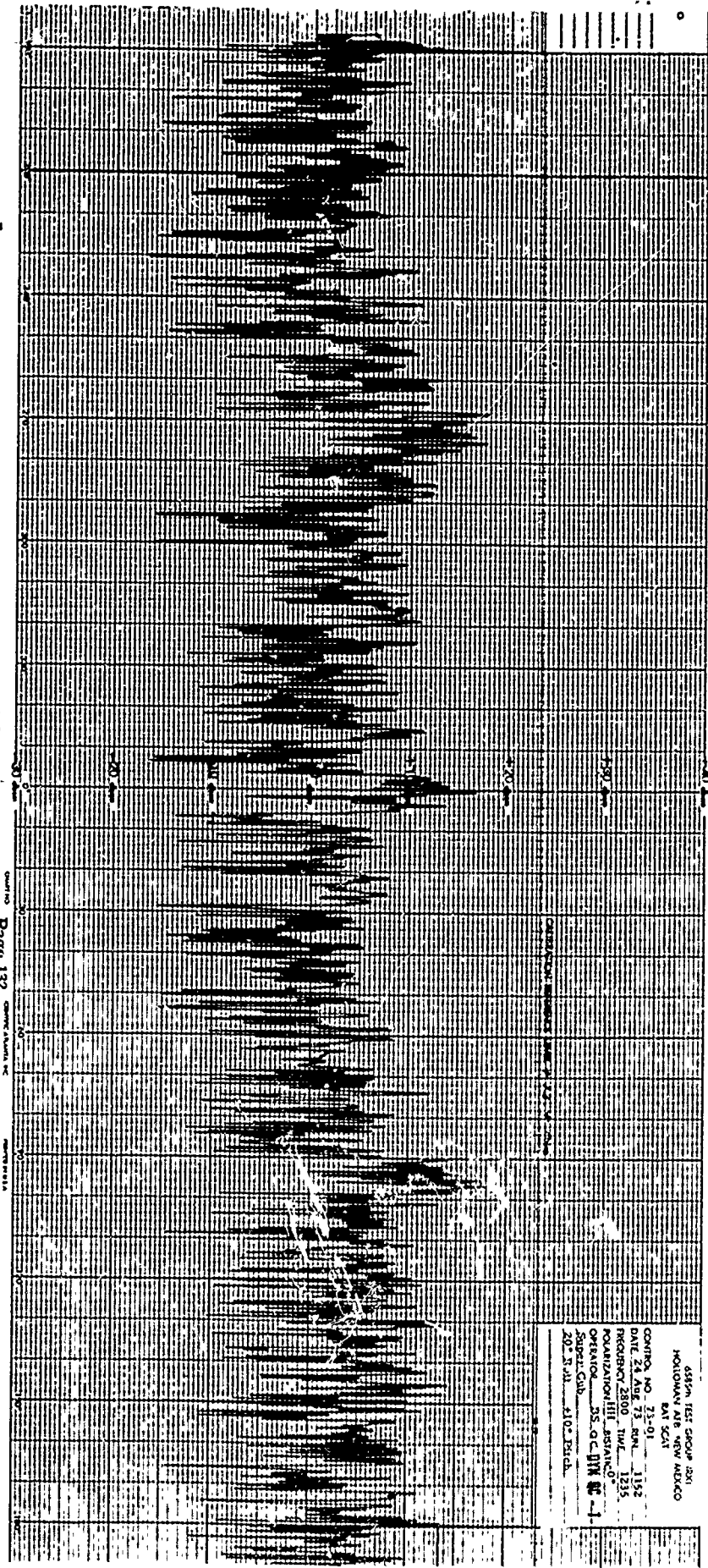




4551, TEST GROUP 101
HOLLAND AFB, NEW MEXICO
PAT SCAT
CONTRACT NO. 73-01
DATE: AUG 73, MW, 915
RECORDING: 2800, TIME 1725
POLARIZATION: JH, 450V, 60°
OPERATOR: ALK, 000112, 1
Supr. Cdb
20° Roll, 0° Pitch

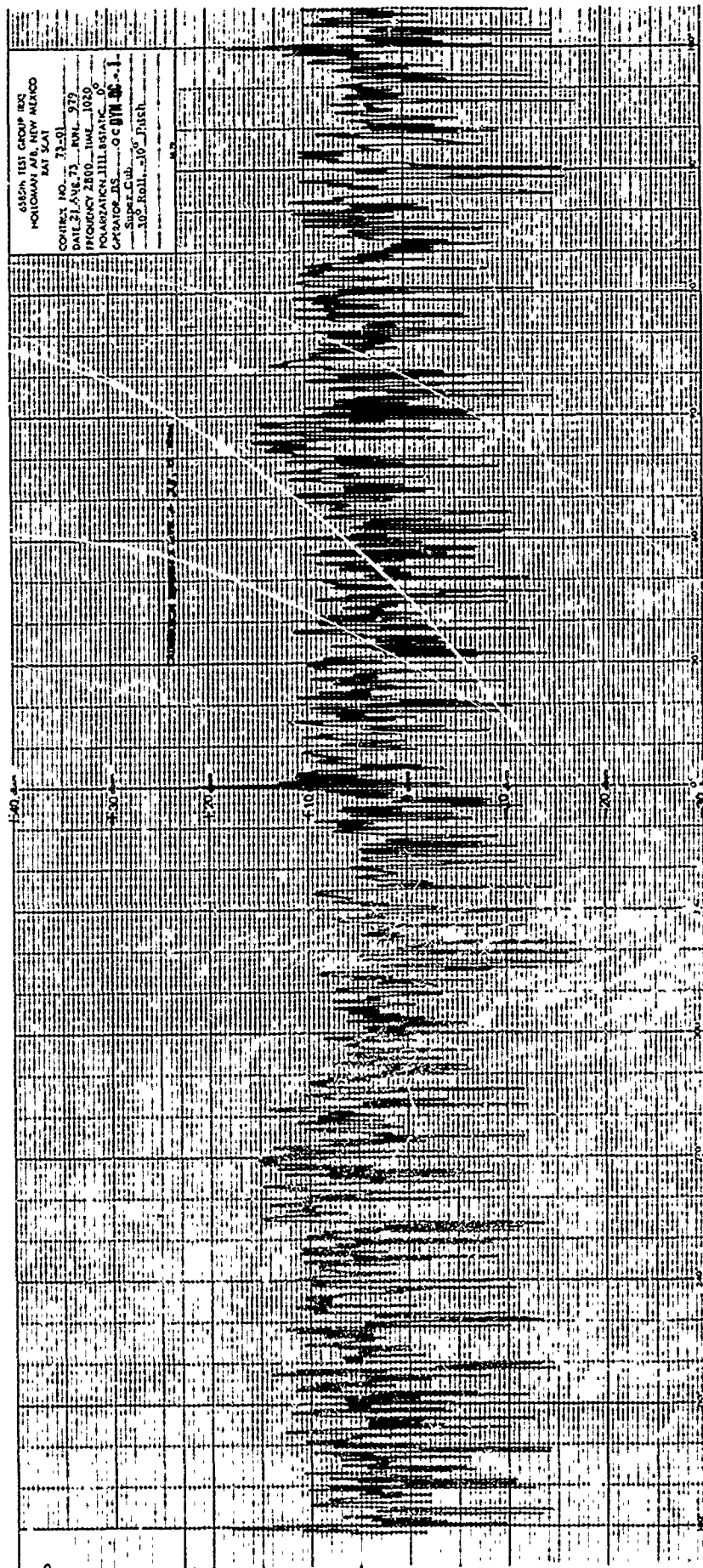


6585A TEST GROUP (B)
HOLLOMAN AIR, NEW MEXICO
BAT SCAT
CONTROL NO. 71-01
DATE 7 AUG 73 RW 1059
FREQUENCY 2800 MHz 1310
POLARIZATION III ASTANG 00
OPERATOR JS - OC 0111 M - 1
Super Cub
20° Roll 450 Pitch

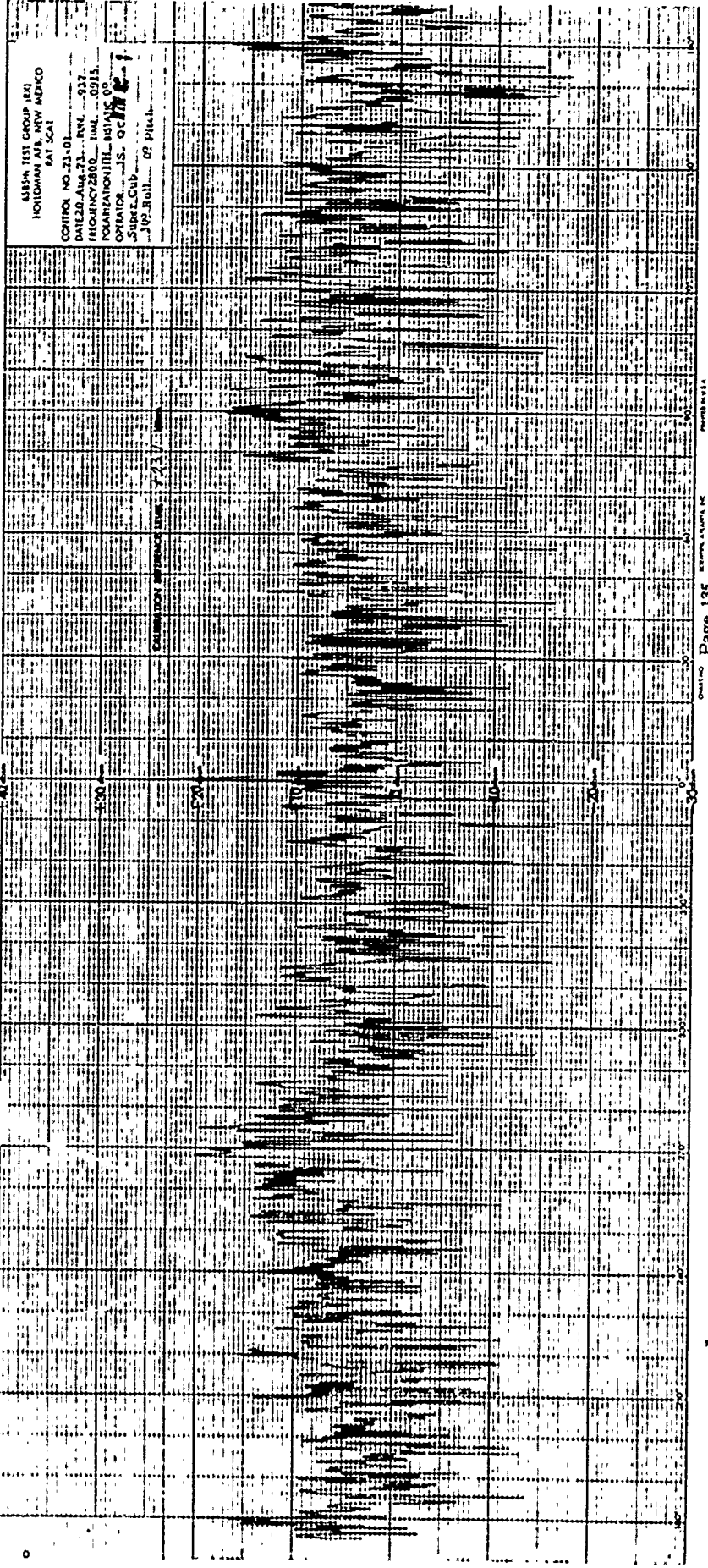


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688TH TEST GROUP 1321
 HOLLOMAN AIRFB ARIZONA
 24 OCT 1953
 CONTROL NO. 75-01
 DATE 24 OCT 1953
 FREQUENCY 2800 MHz
 POLARIZATION HORIZONTAL
 OPERATOR 35.0 C. J. W. 1321
 SUPER. GAB
 20° S. 41° 410° 1321



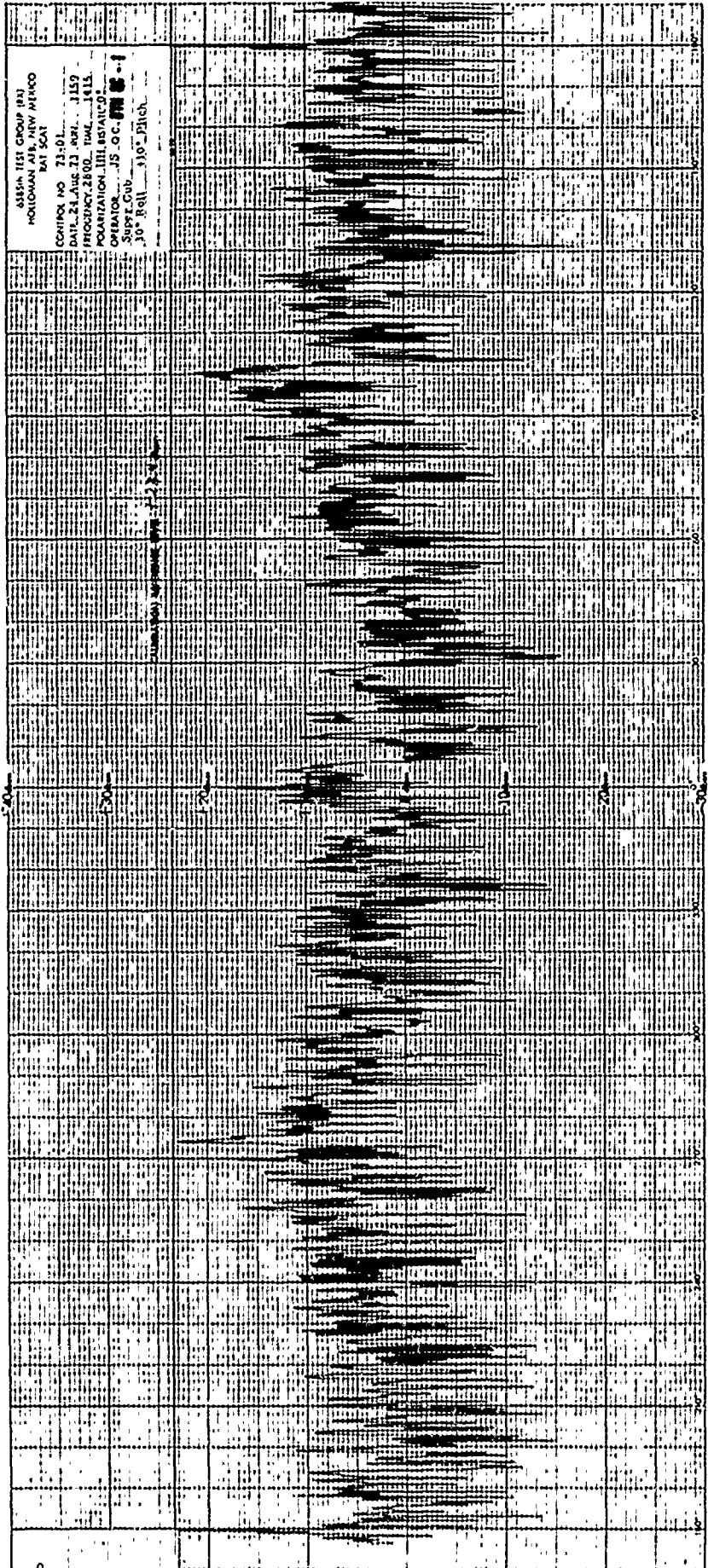
Page 134



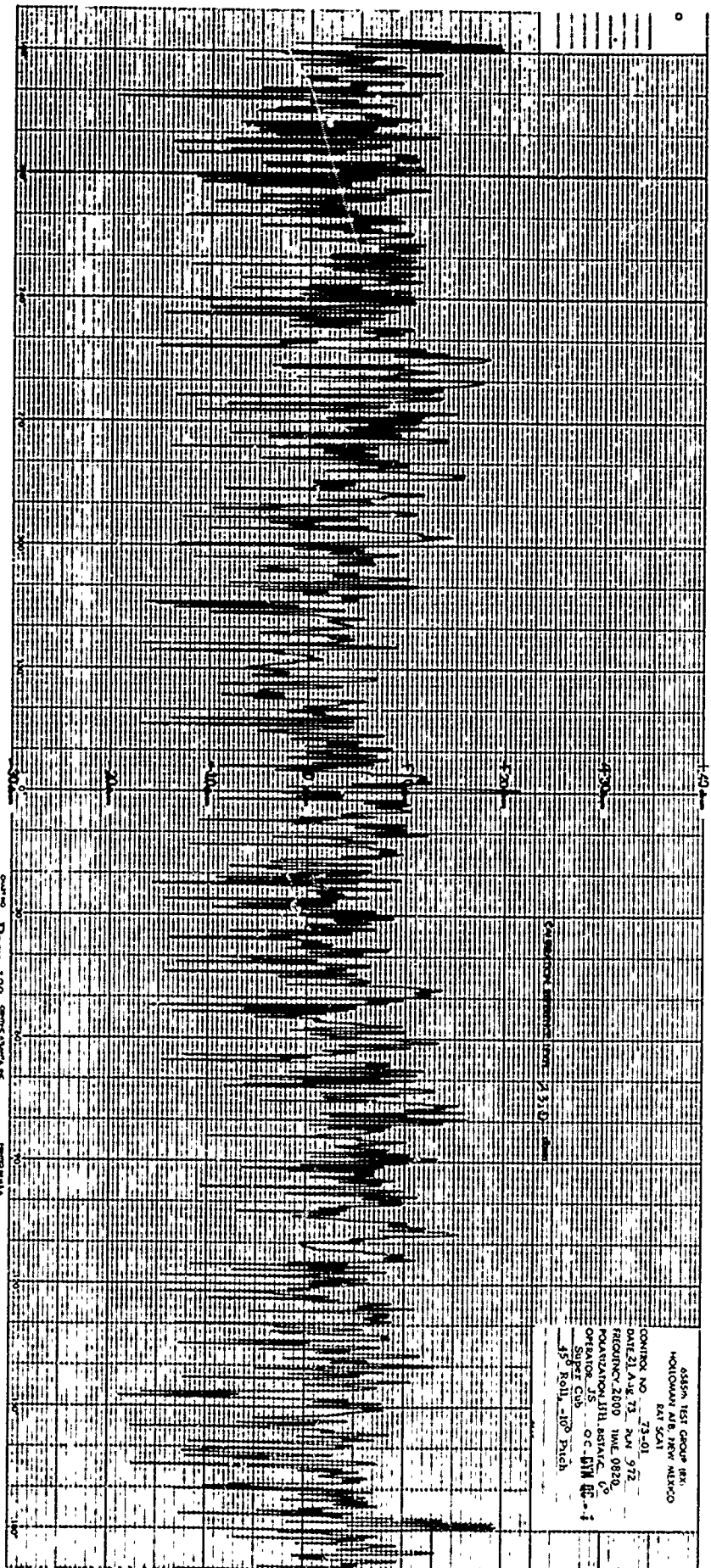
ASSIGN TEST GROUP 101
HOLDING TEST GROUP 102
RAT SCAT

CONTROL NO 21-01
DATE 20 AUG 71
FREQ 72800
POTENTIAL 100
ONVATOR JS. OCT 10 1971
SUBJECT 101
30 Roll of Film

Order no. **Page 136** COMPANY: A. NUNZIATA, SNC FORMED IN U.S.A.



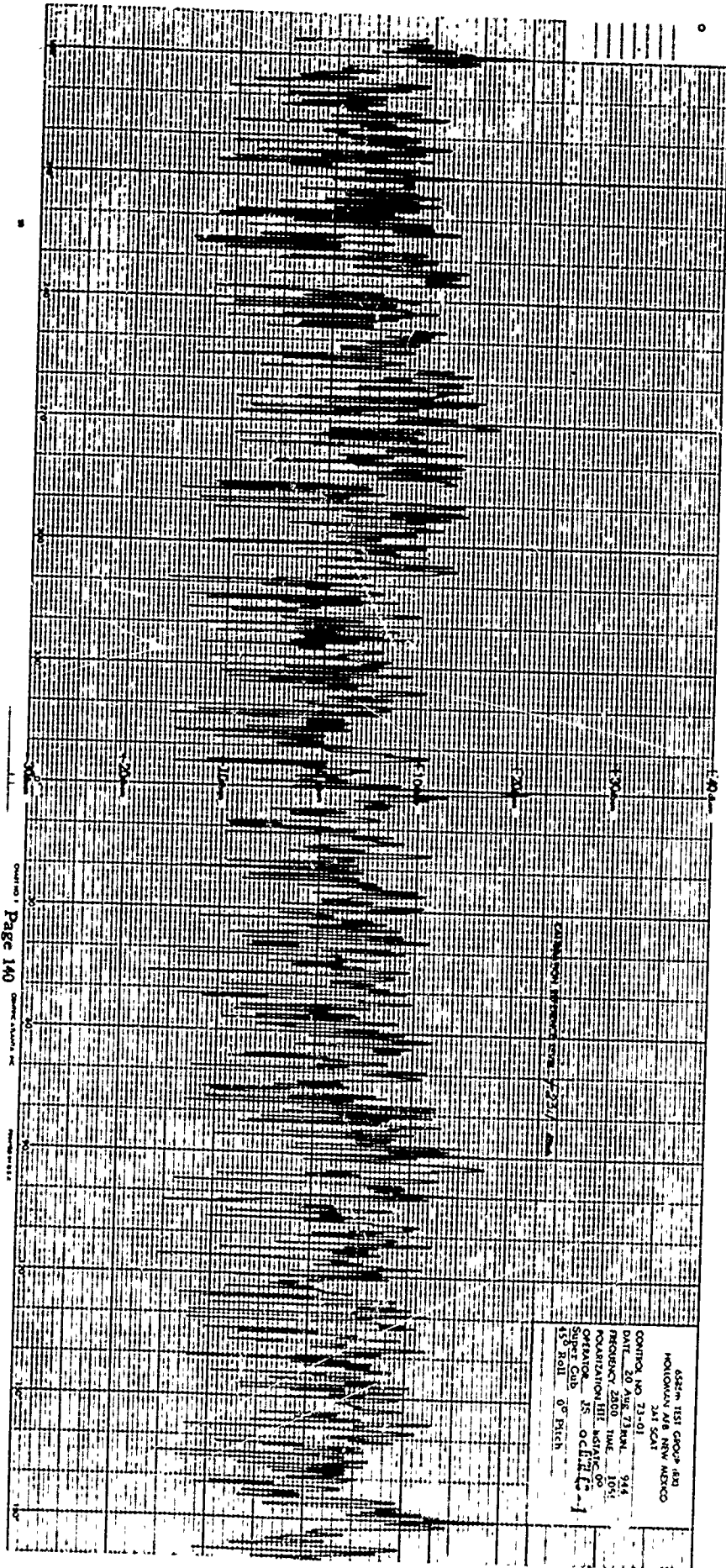
635th TEST GROUP (B)
HOLLOMAN AFB, NEW MEXICO
EAT SCAT
CONTROL NO 73-01
DATE 24 Aug 73
TIME 1159
FREQUENCY 2800
POLARIZATION ILLI BSTATC
OPERATOR JS OC
SUPT GUB
30° Roll 110° Pitch

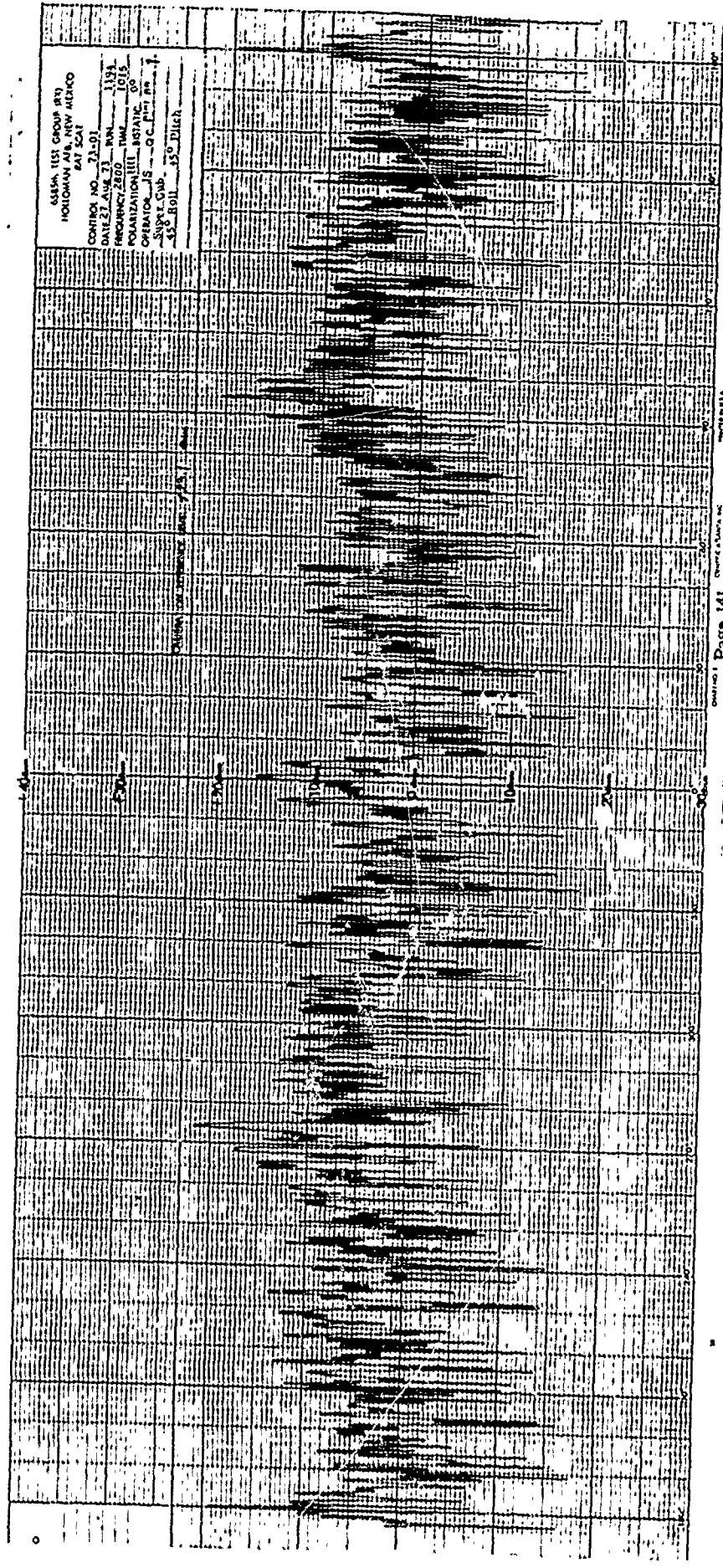


6585N TEST GROUP (R)
 HOLLAND AFB, TEX MEXCO
 EAT SCAT
 CONTROL NO. 73-01
 DATE 21 AUG 73 RUN 972
 FREQUENCY 2000 TIME 0820
 PLANTATION 1111 BSMAC U
 OPERATOR JS OC 6111 EC-1
 SUPER CUB
 45° Roll, 10° Pitch

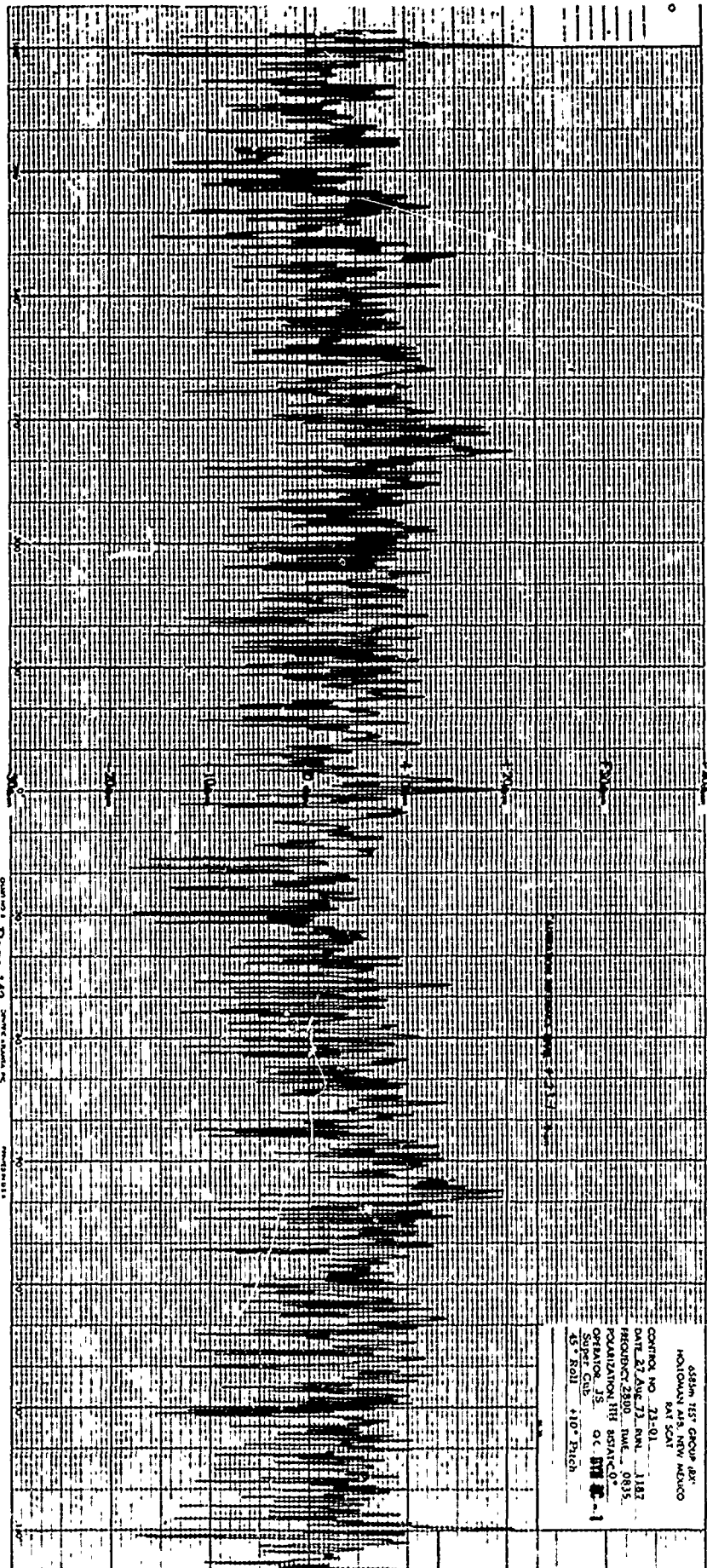
6854- TEST GROUP (BA) HOLLOMAN AFB, NEW MEXICO EAT 501 CONTROL NO 71-01 DATE 20 JUL 71 544 351 FREQUENCY 2800 THZ 1030 POLARIZATION LINE ESTIMATE STRAIGHT 10 15 00 00 45-ROLL -50-THICK	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 8
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ASST. TSI GROUP AIR
HOLLAND AIR NEW MEDCO
241 SCAI
CONTRACT NO 73-01
DATE 20 Aug 73
FREQUENCY 2000 TUE 104
REARIZATION HIR 4510 00
ORATOR 35-0011715-1
Super Cub 05 Pich
150 Roll



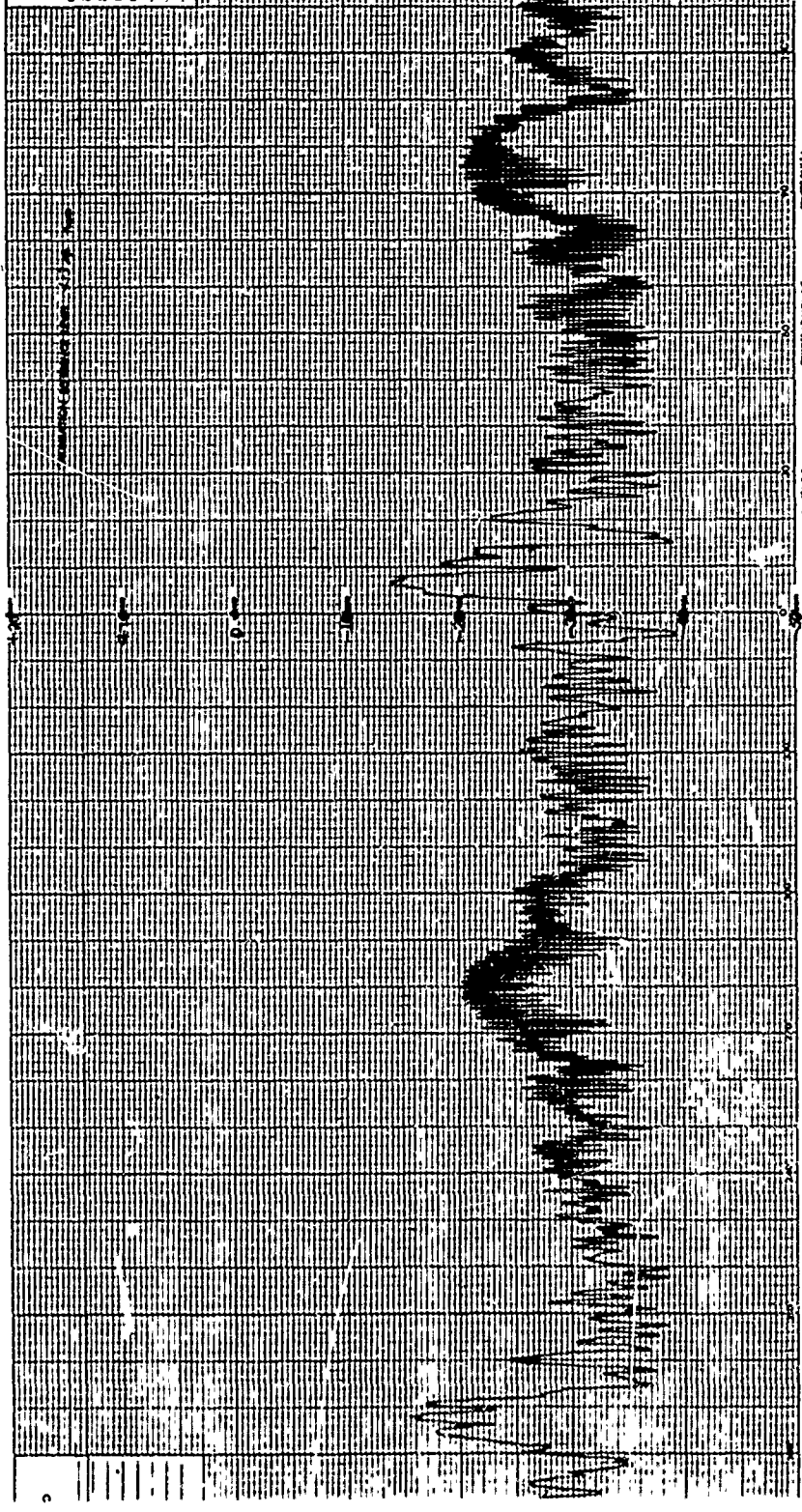


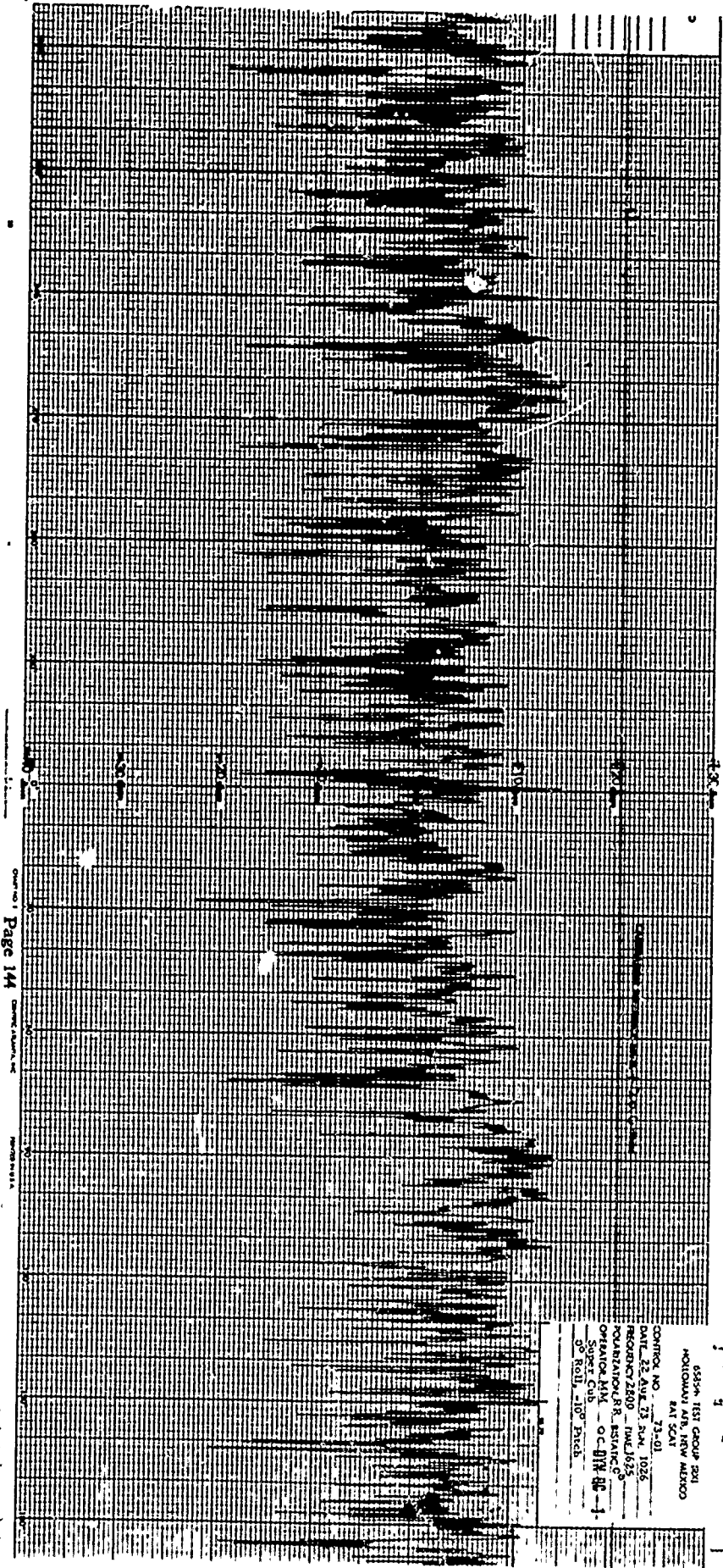
335th TEST GROUP (RT)
HOLCOMB AFB, NEW MEXICO
EAT SCAT
CONTROL NO. 72-01
DATE 27 AUG 73 RUN 1193
FREQUENCY 2800 TIME 1015
POLARIZATION IIII - STATIC 00
OPERATOR JS - O.C. P.M. 10
SUPER GRP. 350 DUGN



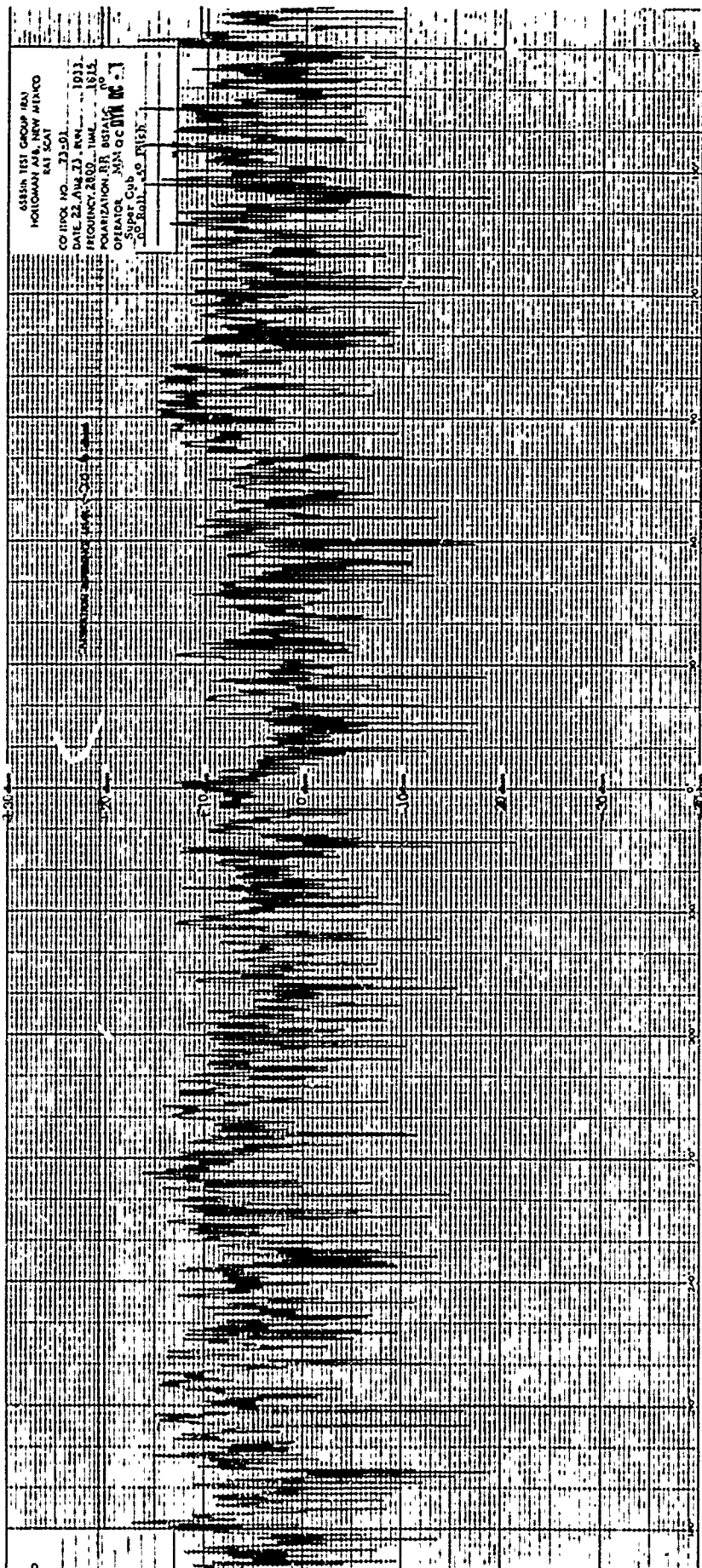
455th TEST GROUP BPT
 HOLLOMAN AFB, NEW MEXICO
 BPT 501
 CONTROL NO. 71-01
 DATE 27 AUG 71 RUN 1187
 FREQUENCY 2500 KHz - 0835
 POLARIZATION HH 851410°
 OPERATOR JS OC 8711 2-1
 Super CUB
 45° Roll 110° Pitch

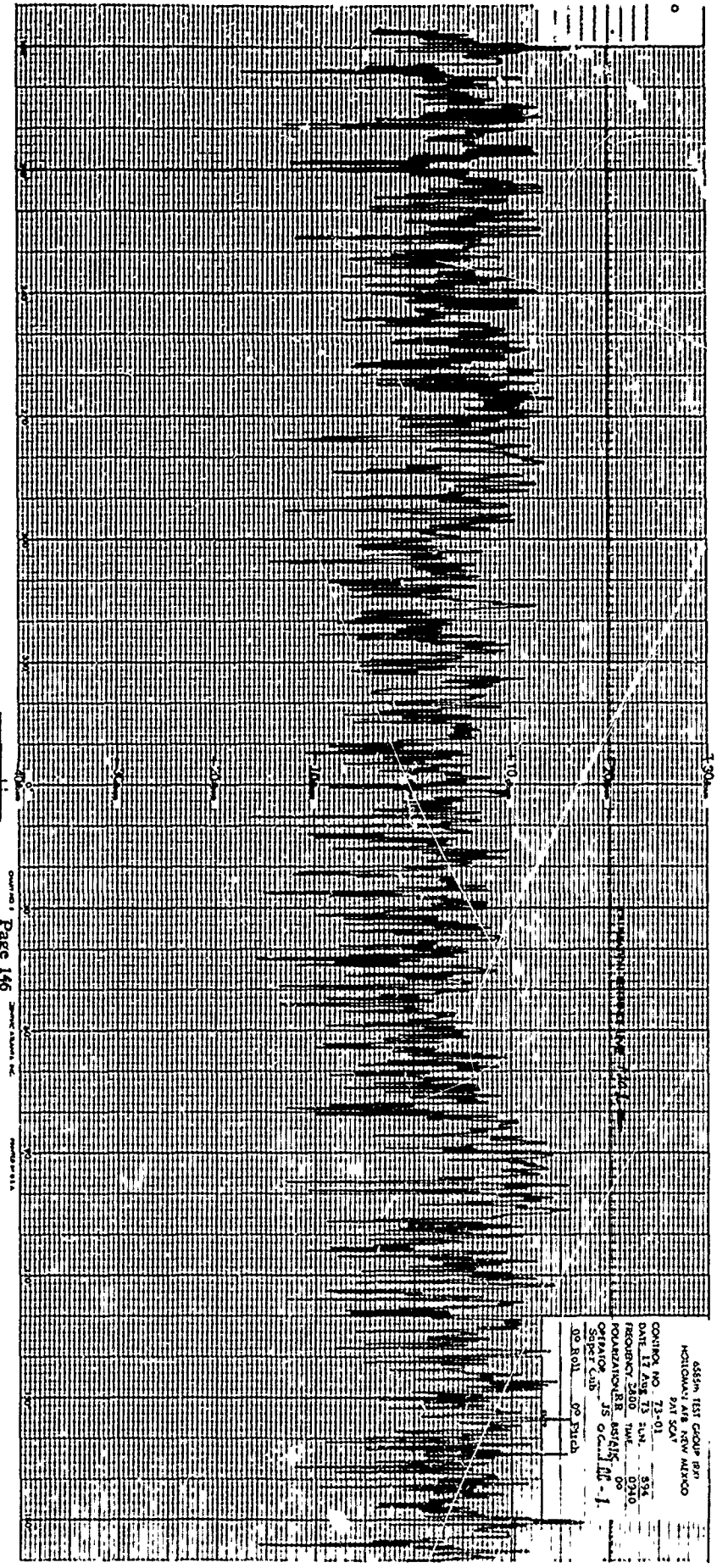
ASSIGN TEST GROUP (B3)
 HOLLOMAN AFB, NEW MEXICO
 EAT SCAT
 CONTROL NO. 73-01
 DATE 24 AUG 73 RPL 1167
 FREQUENCY 2800 THz 1810
 POLARIZATION III INSTANT 0
 OPERATOR MLOC
 Background
 With Columns & Transitions





6534th TEST GROUP B21
HOLLOMAN AFB, NEW MEXICO
BAT SCAT
CONTROL NO. 73-01
DATE 22 AUG 73 1026
REQUENCY 2800 - 1001625
POSITION 08R - 1001625
OFFICIAL NAME - OC 0174-1
Super Cub
90 Roll, 100 Pitch





5553m TEST GROUP 187
HORIZONTAL AIR NEW ALZECO
VIA SON
CONTROL NO 12-01
DATE 11 AUG 13 1961
FREQUENCY 2000 Hz
POLARIZATION 00
ORIGINATOR 35 00-11-1
DE ROLL 02 1500

ACBEM TEST GROUP 180
HUTCHMAN 416, NEW MEXICO
WAT 201

CONTROL NO. 72-01

DATE 21 AUG 72 MON 1110

FACILITY 2813 DIAL 2115

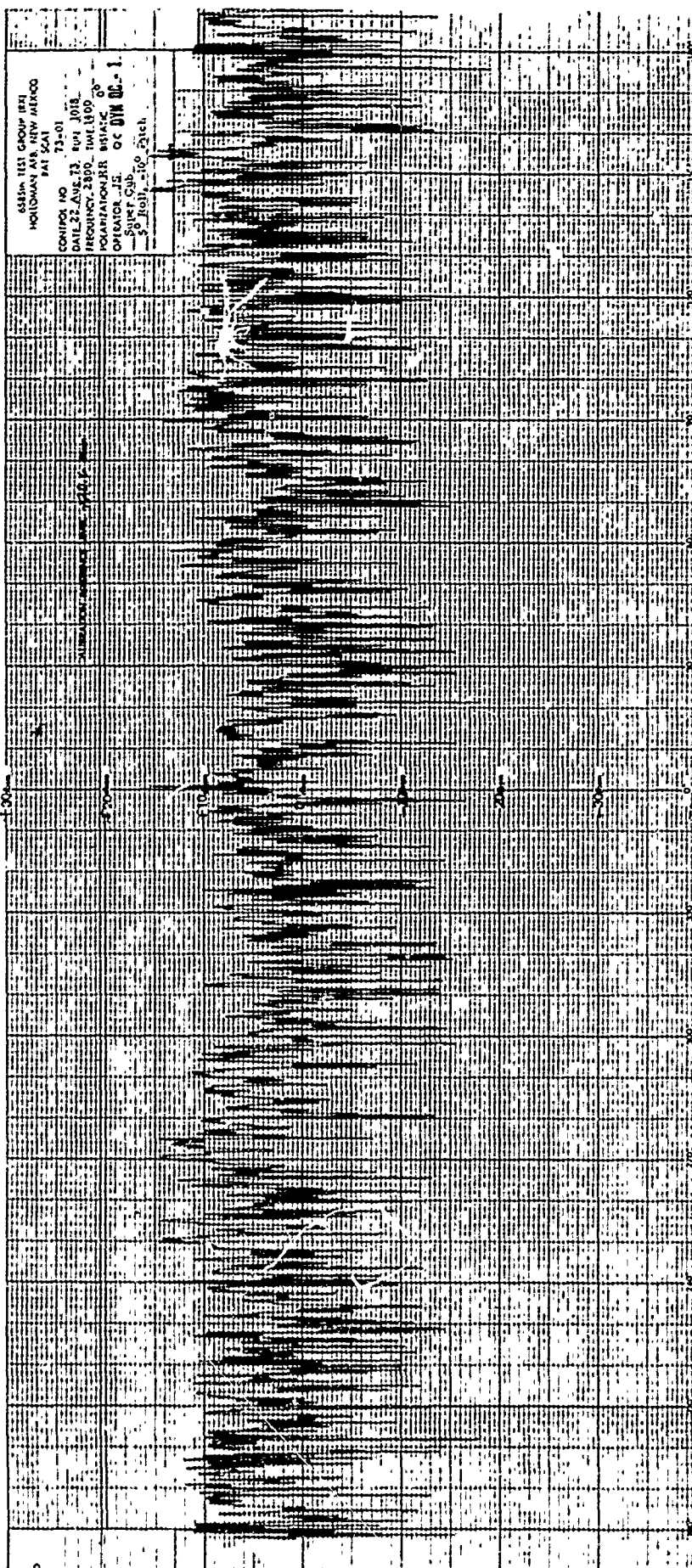
INTEGRATION RR 5111N 00

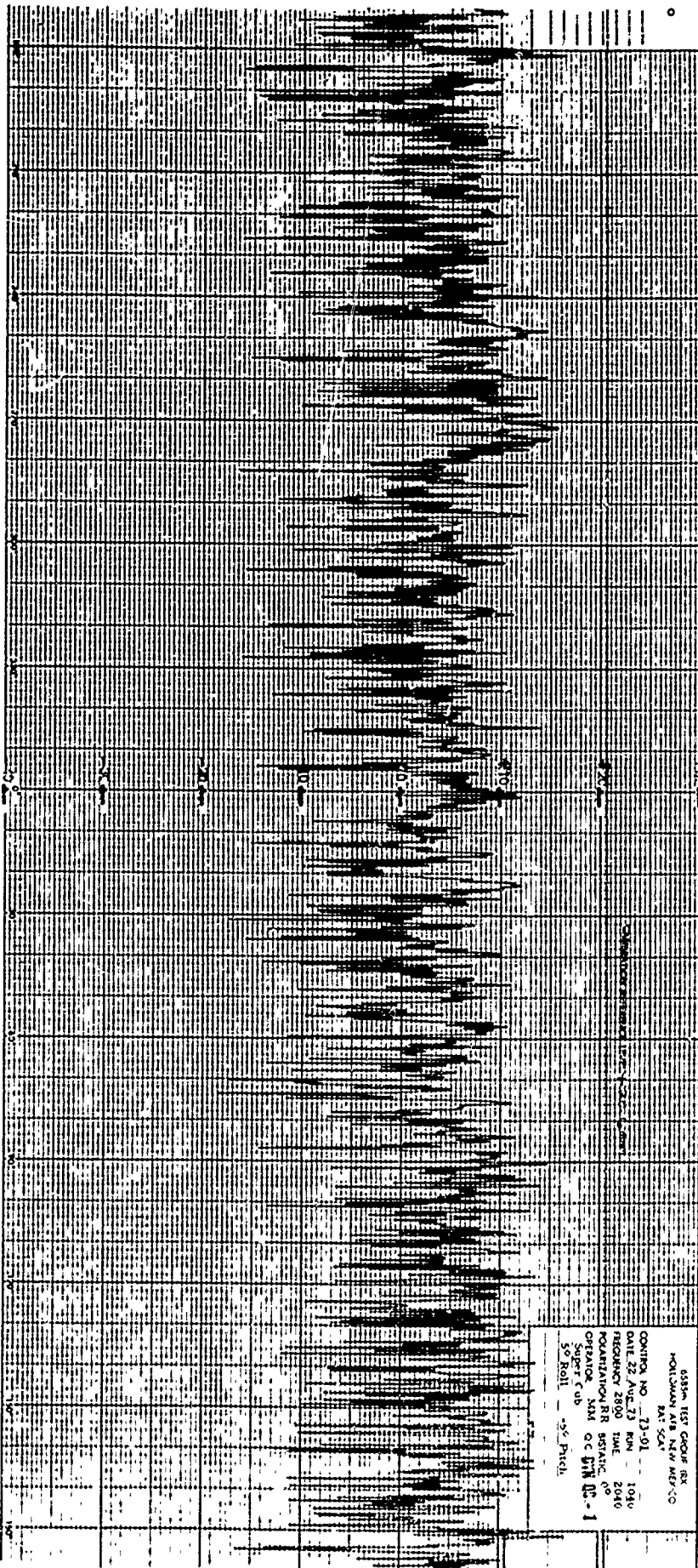
OPERATOR 333 G.C. 100 1

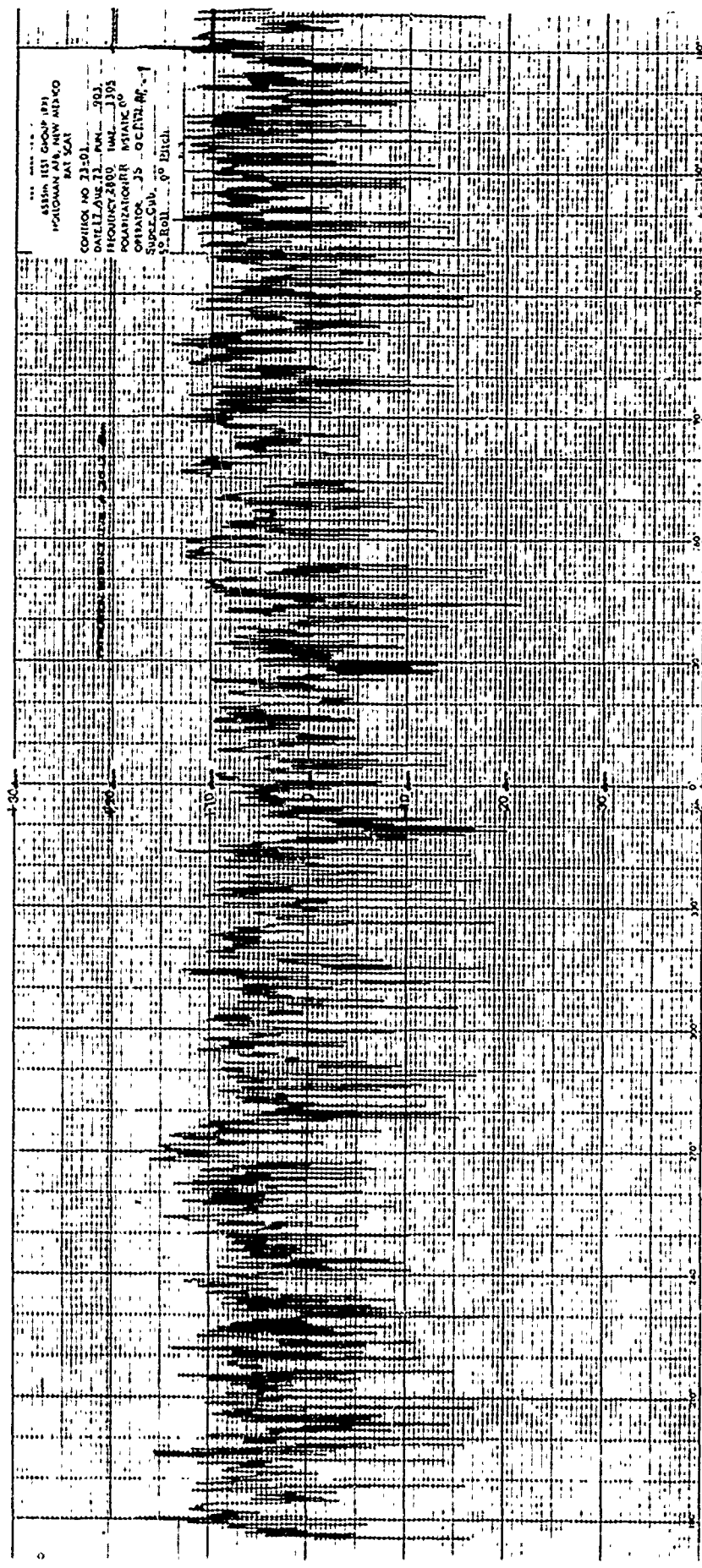
SUPPLY CUB 132 Pitch

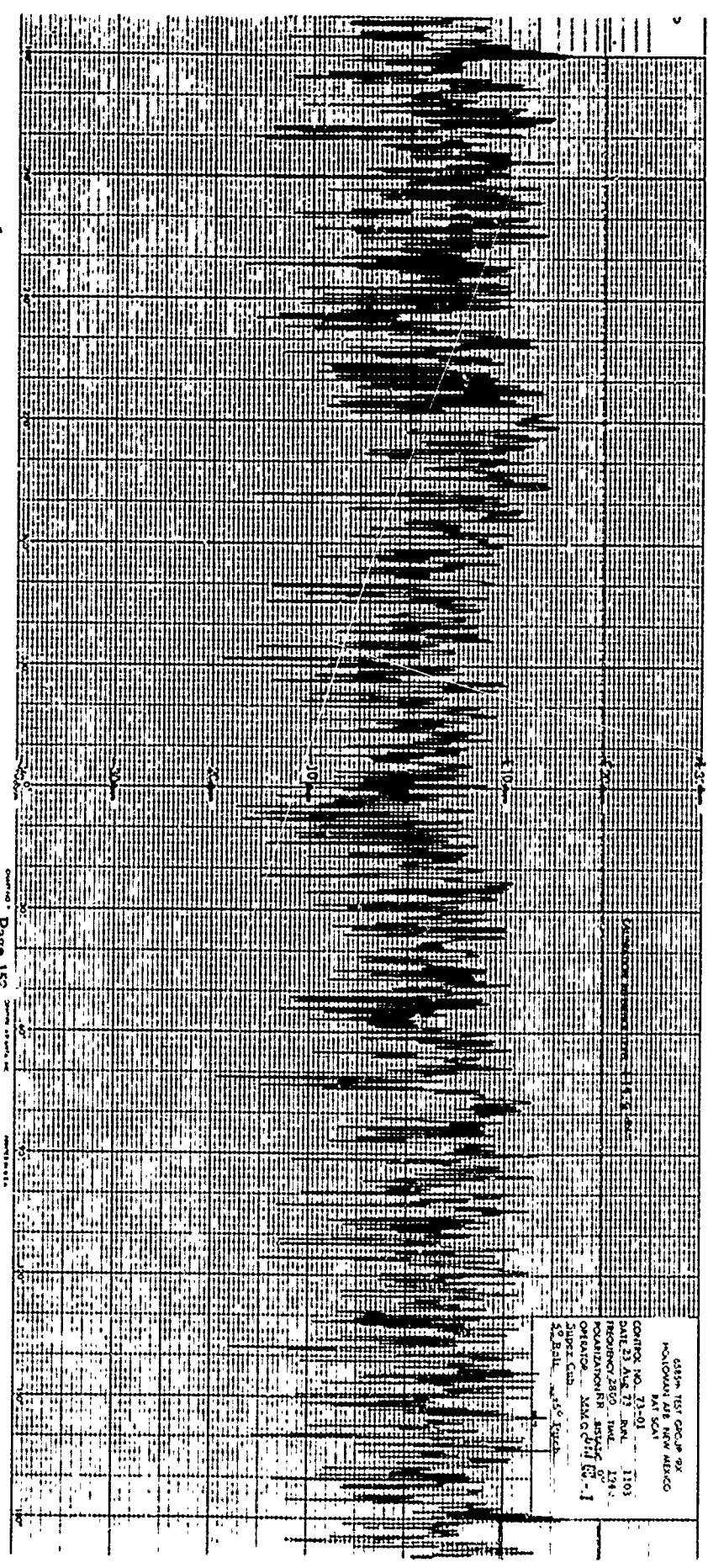
PO ROLL

555th TAV GROUP HQ
HOLLAND AIR ARW AFKCO
EAT SON
CONF NO 73-01
DATE 24 AUG 1964 1130
FREQUENCY 2400 MHz 0700
POSITION/PR BEING
OPERATION JS 0-01M E-1
SPEC LAB 4107 Field
20 A01L









655th TEST GROUP 92
HOLLOMAN AFB NEW MEXICO
BAT 501
CONTROL NO. 73-01
DATE 23 AUG 73 RUN 1103
FREQUENCY 2800 MHz
POLARIZATION RH
ORIENTATION 340.0
SPECT CUB
50 Bolt 45 Inch

ASIA TEST GROUP (AT)
HOLCOMB, PA. 15116

CONTROL NO. 23-01

DATE 12-21-77

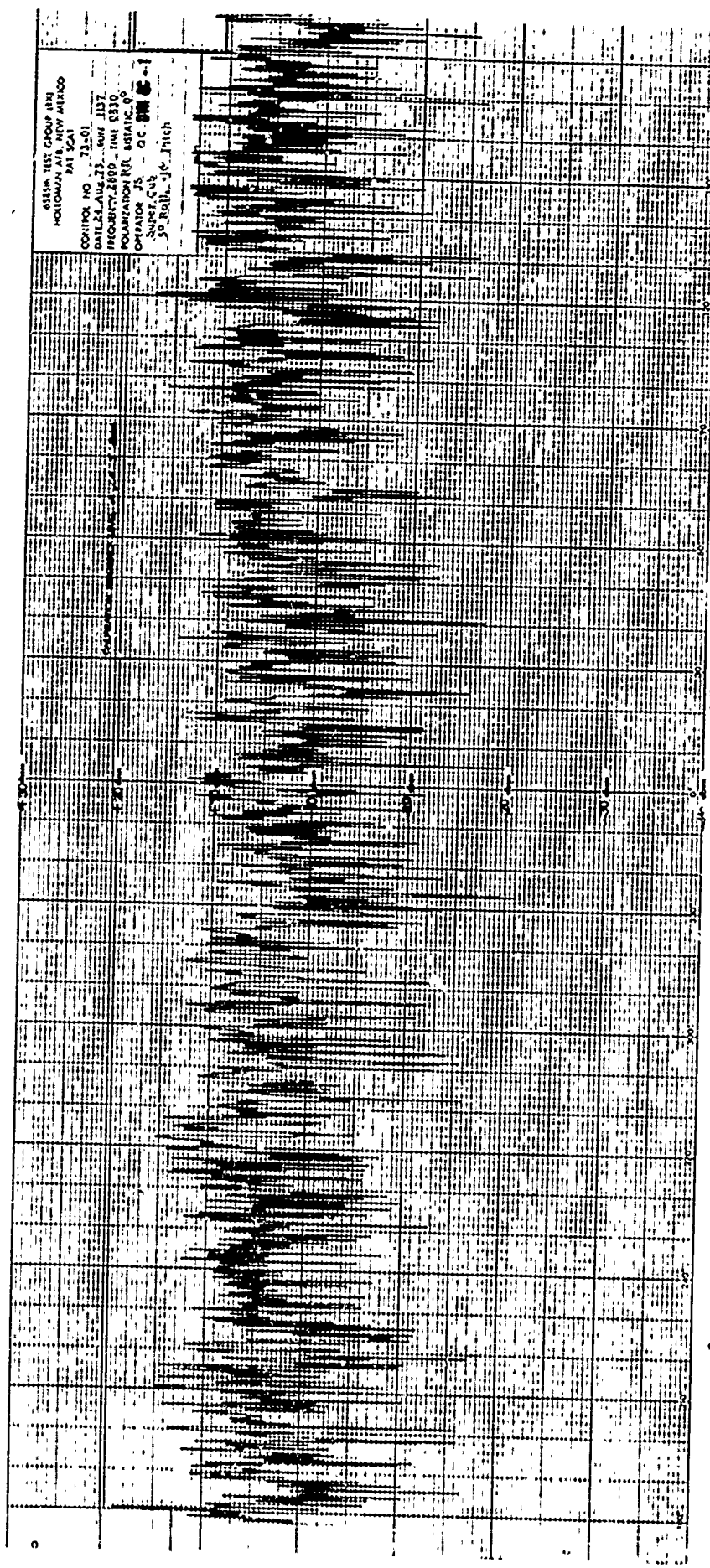
PROJECT/TEST - NEW 117

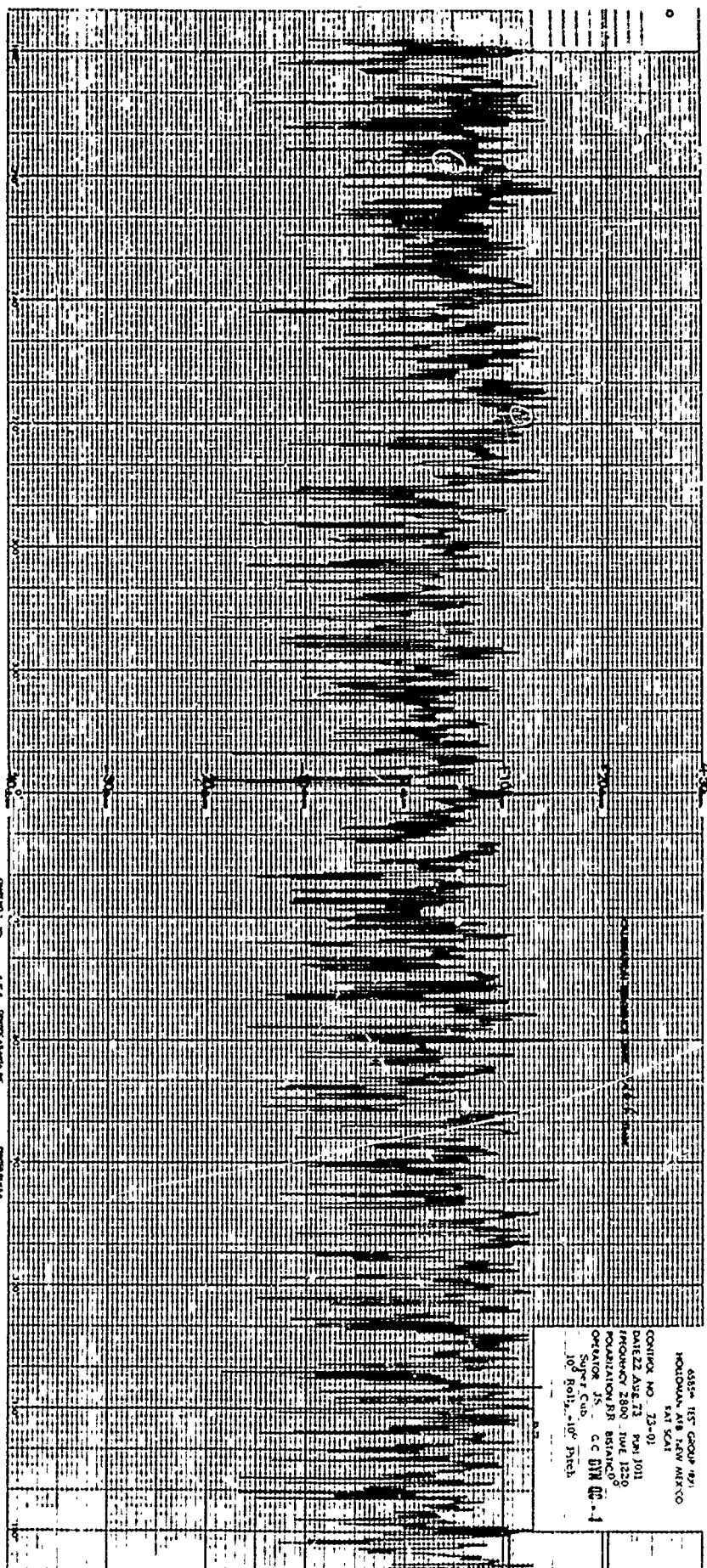
POUR/TEST - INE 1330

OPERATION - GC

Super Cub

30 Ball, 1/2" Pitch





635TH TEST GROUP B11
HOLCOMB AFB, NEW MEXICO

AT SCAT

CONTROL 120

DATE 23 AUG 73

TIME 1000

FREQUENCY 2800

MODE FM

OPERATOR JS

STATION 0

SUPERVISOR

205 1001

205 1001

205 1001

205 1001

205 1001

205 1001

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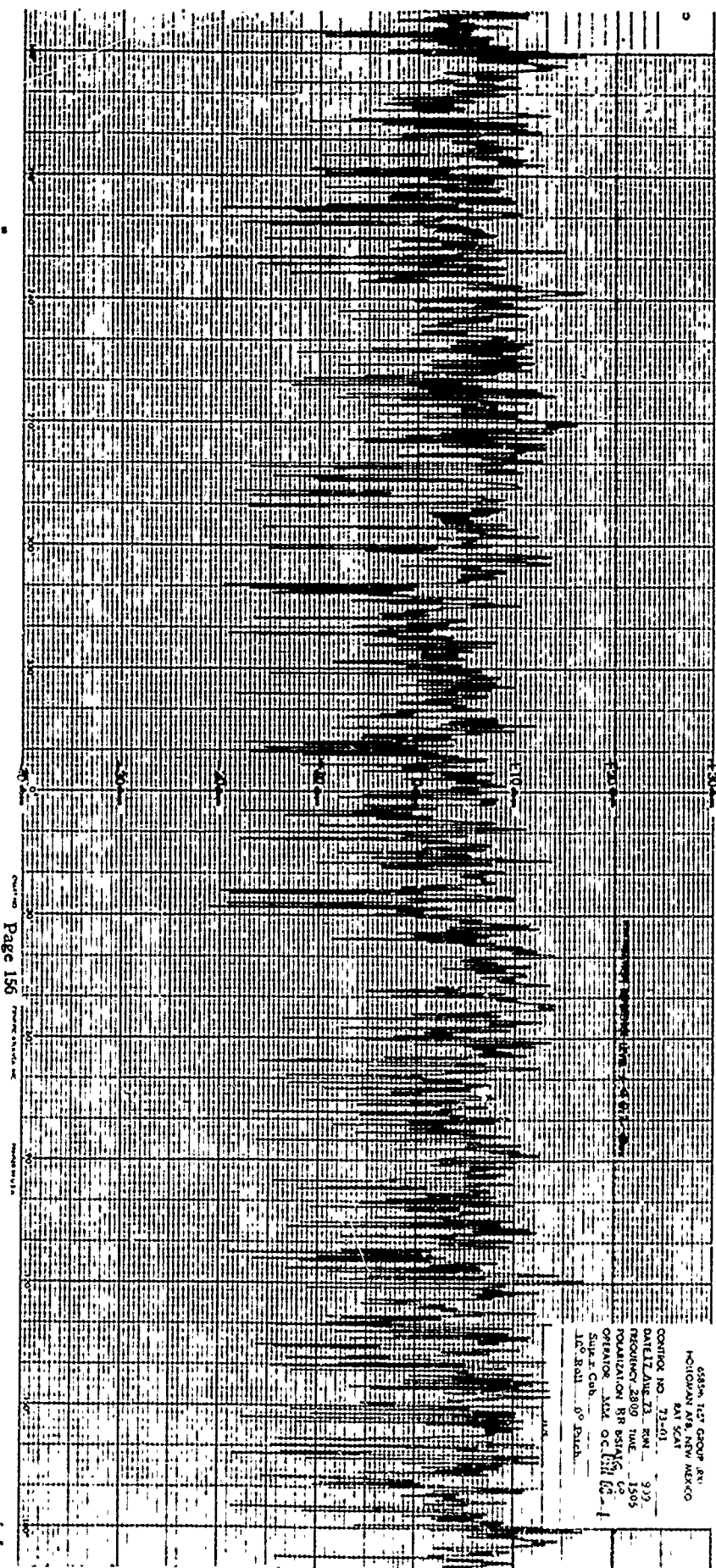
205 1001

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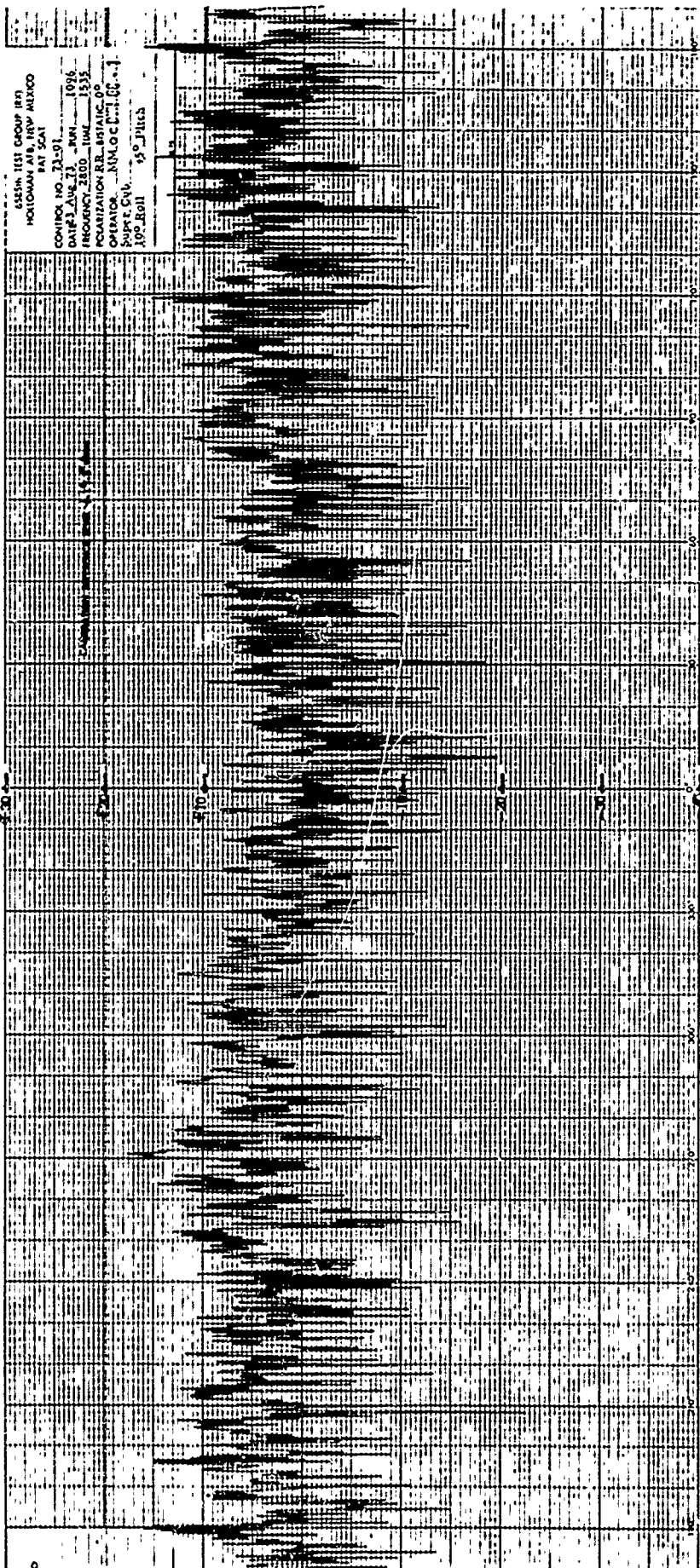
205 1001

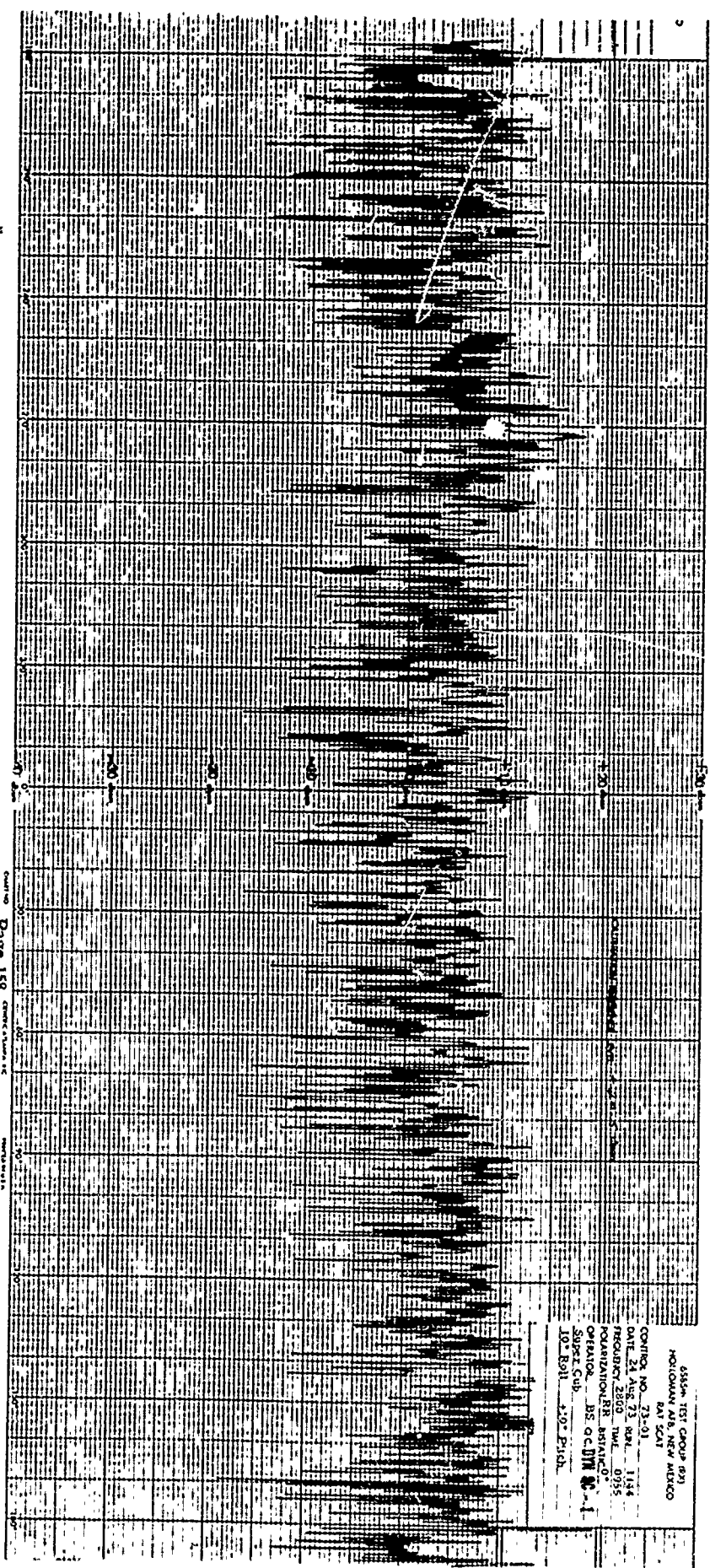
205 1001

205 1001



655N, 145° GROUP, 801
 HOTOJAN AIR, NEW MEXICO
 801 501
 CONTROL NO. 73-01
 DATE 12 AUG 73 RUN 919
 FREQUENCY 2800 HZ 1505
 LOCALIZATION RR 85146, 02
 OPERATOR MDA OC 171 12-1
 SUPER COB
 10° Roll 0° Pitch





5550N TEST GROUP 893
HOLCOMB AFB, NEW MEXICO
AN SCAT
CONTROL NO. 73-01
DATE 24 AUG 73
FREQUENCY 2800 TWT 0735
POLARIZATION RH
OPERATOR BS OC DM SC-1
SHEET 501
10 Roll 450 P101

ASST. TEST GROUP (B)
HOLLAND, ALB. NEW MEXICO
RAT SCAT

CONTROL NO. 13-01

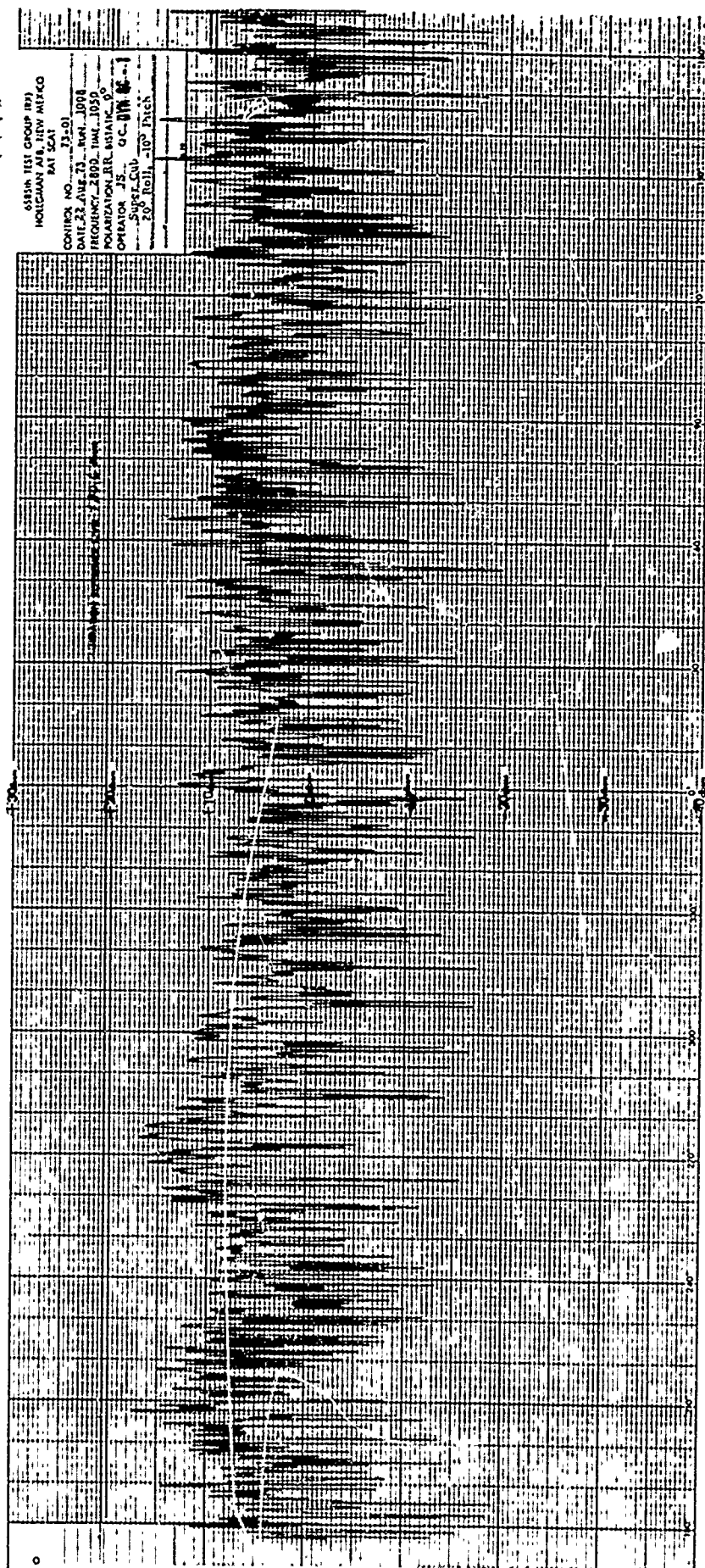
DATE 22 JUN 73 - RAT 1008

FREQUENCY 4890 - 4910

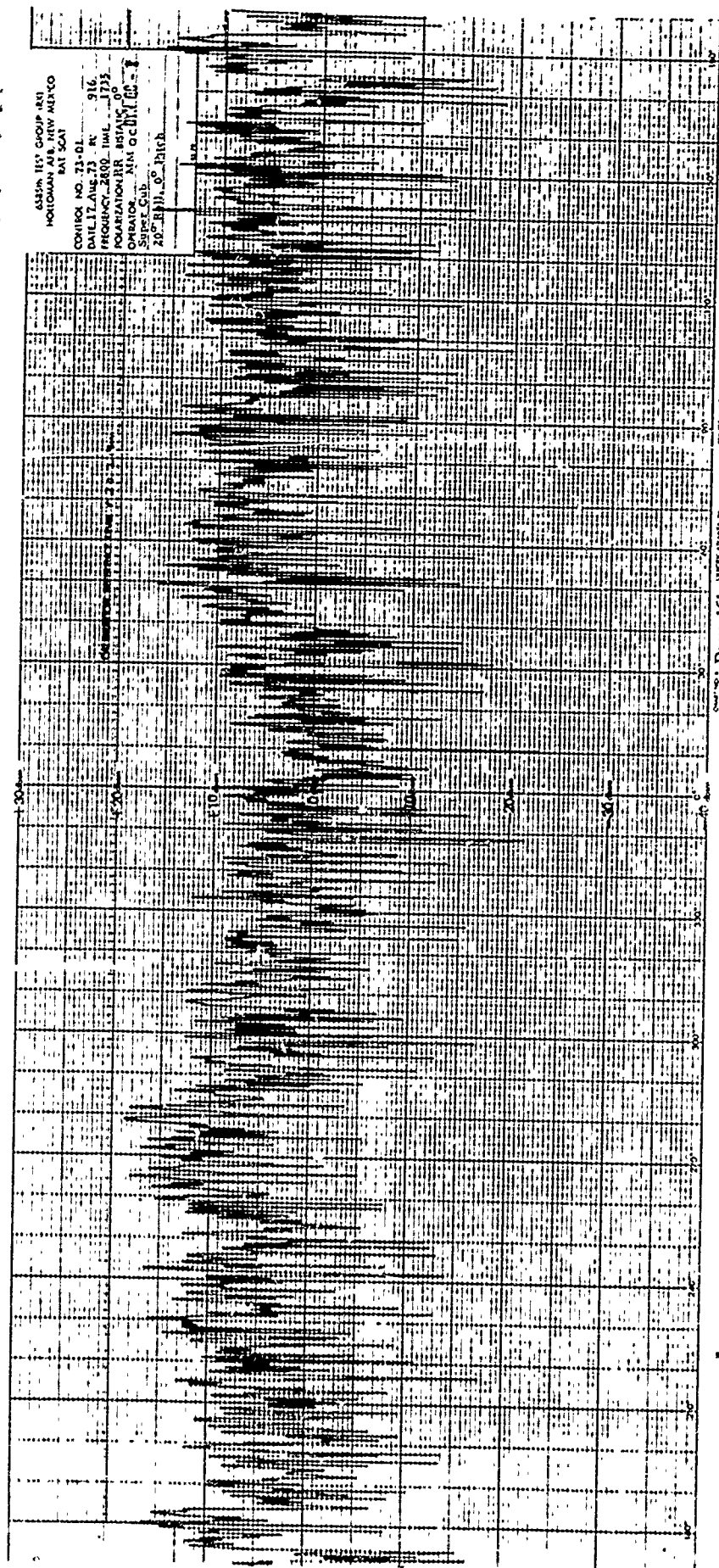
POLARIZATION ETC. INITIALS

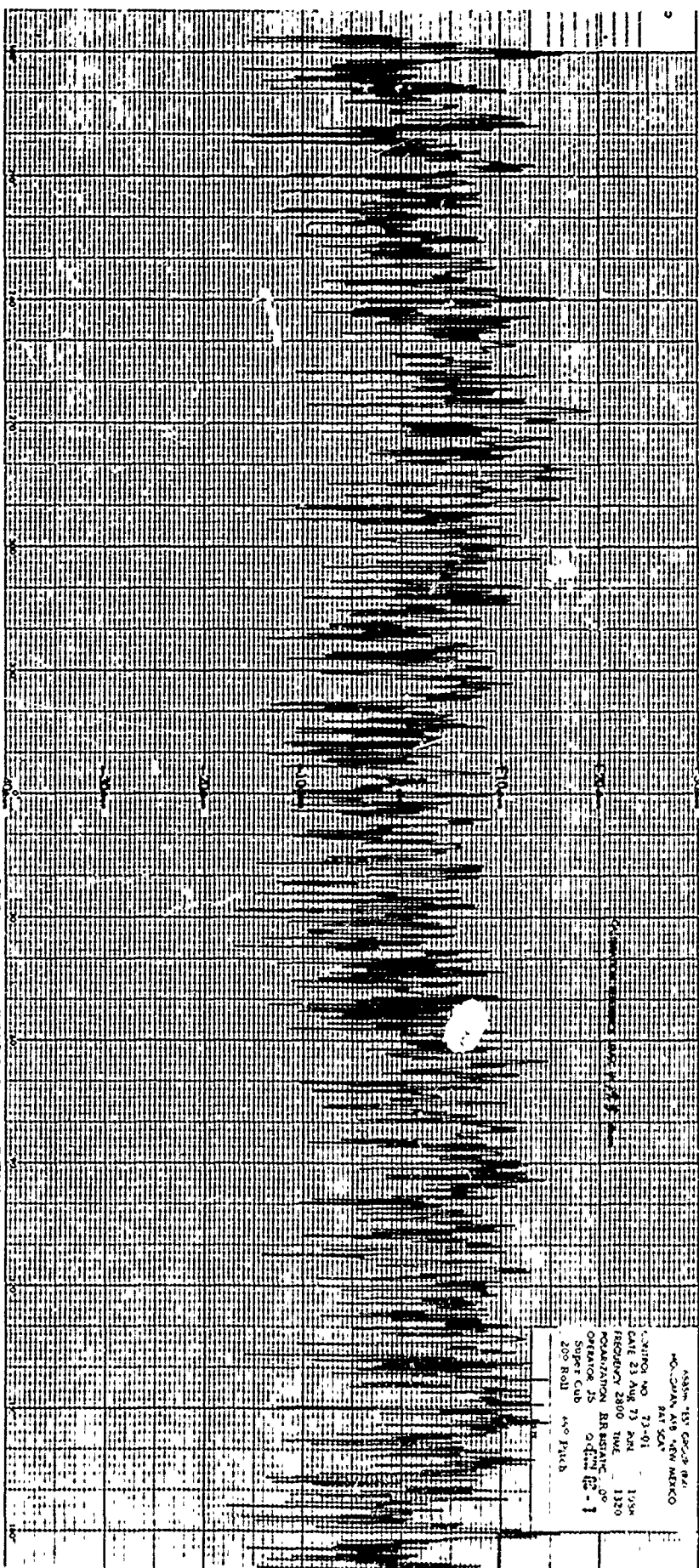
OPERATOR J.S. CC-0110-1

20 JUL 73 - 10:00 PM



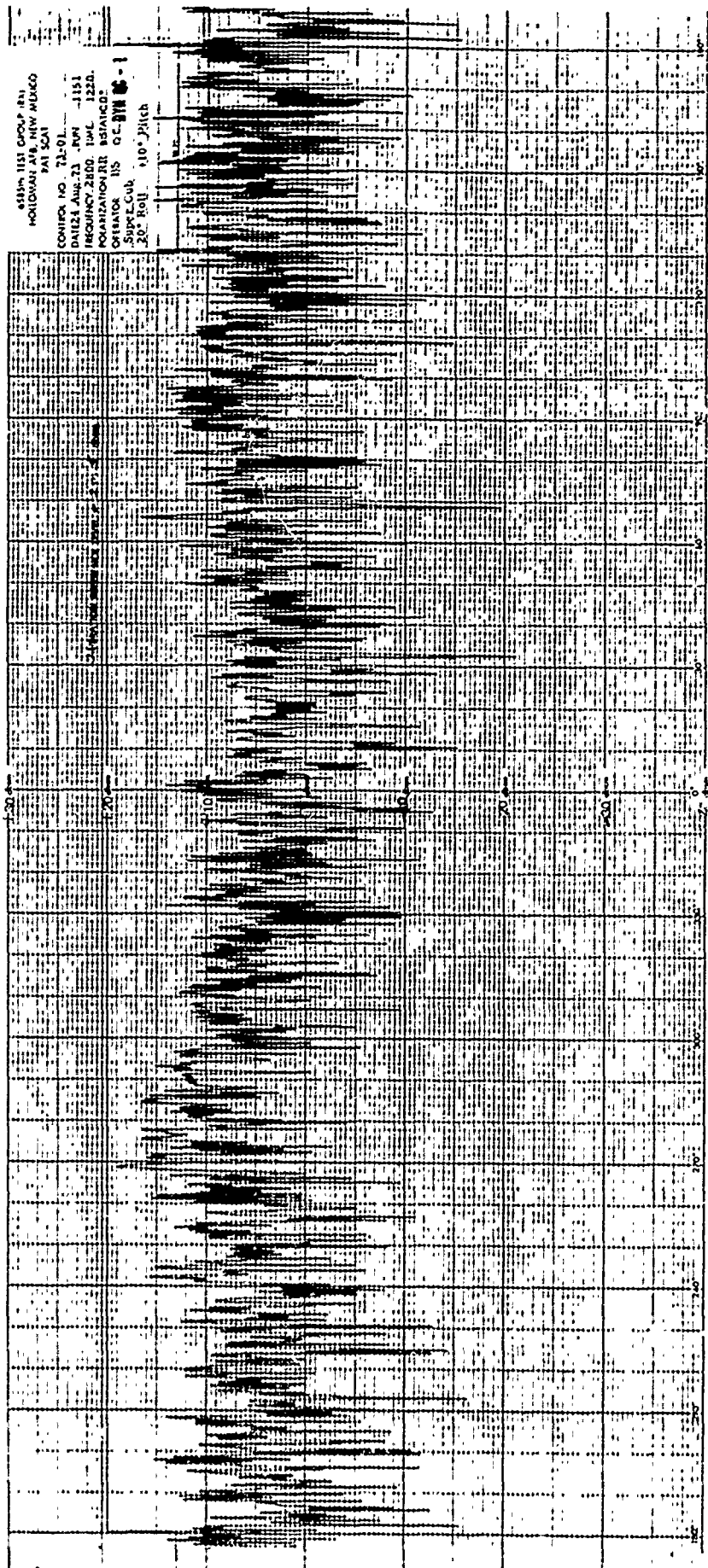
555A 151 GROUP RX
HOLLOMAN 8, NEW MEXICO
MAY 1961
COMPTON NO 13-01
DATE 2/2/61 RXE 1069
RESISTANT 3300 TIME 1000
POLARIZATION 18 BISTATIC 0
ORBITAL JS OC 0111 12-1
SINCE 1961
100-101 100-102

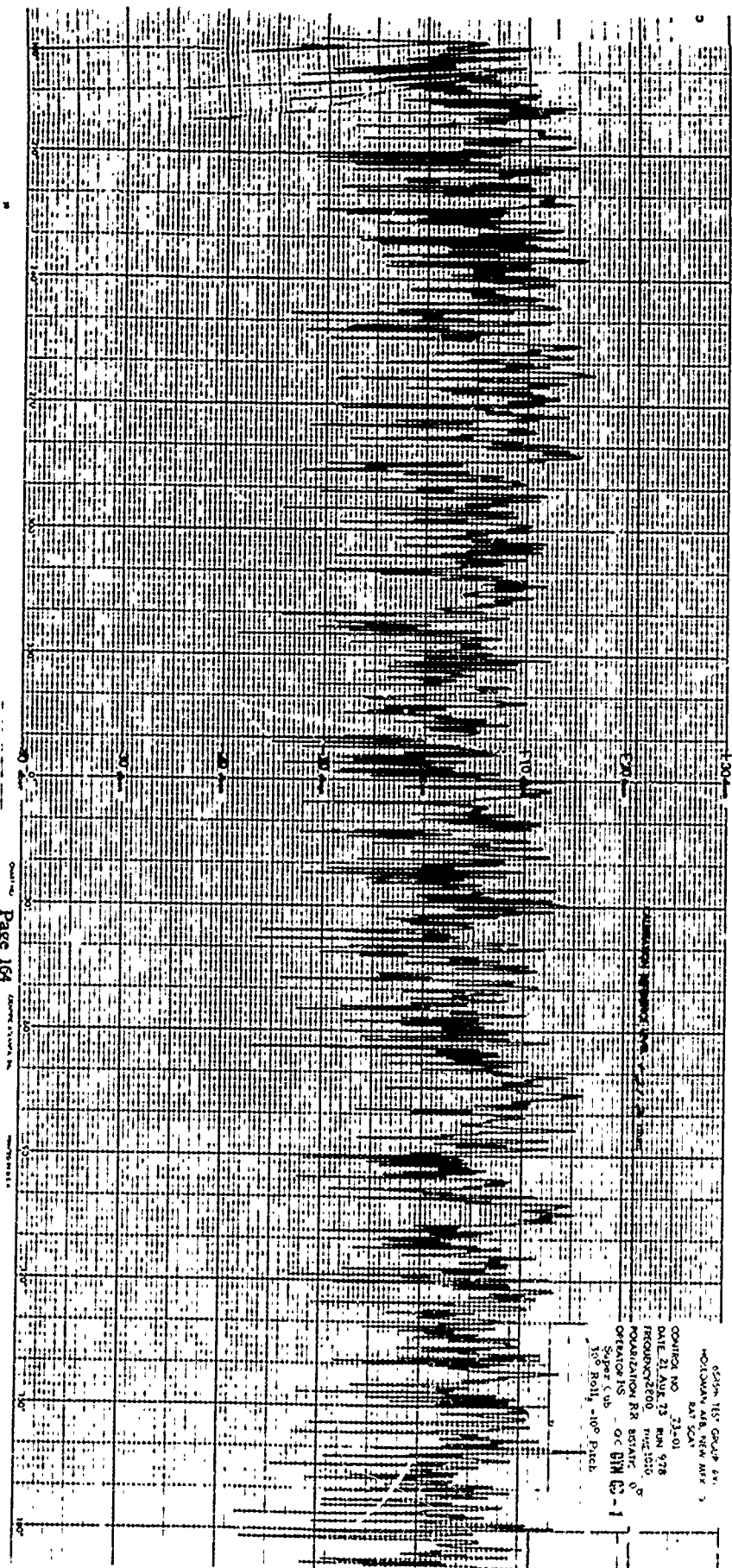


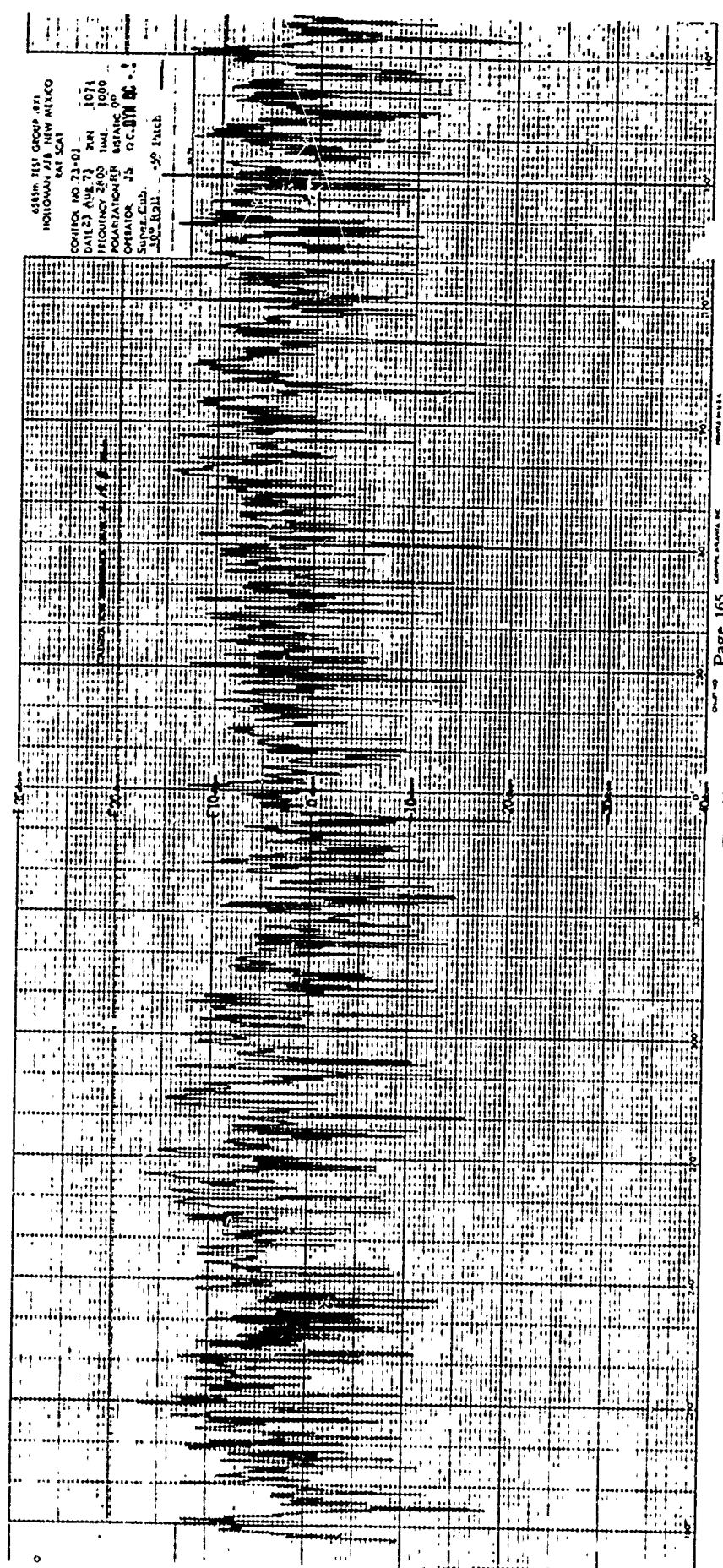


455m 137 C-130 (B-1)
 40.000m 137 NEW MEXICO
 137-01
 DATE 23 Aug 75 TIME 1054
 RECORDING 2800 TIME 1320
 ORGANIZATION BR 8514C-00
 OPERATOR JS 0 dmm 137-1
 Super Cub
 200 Roll
 400 Pitch

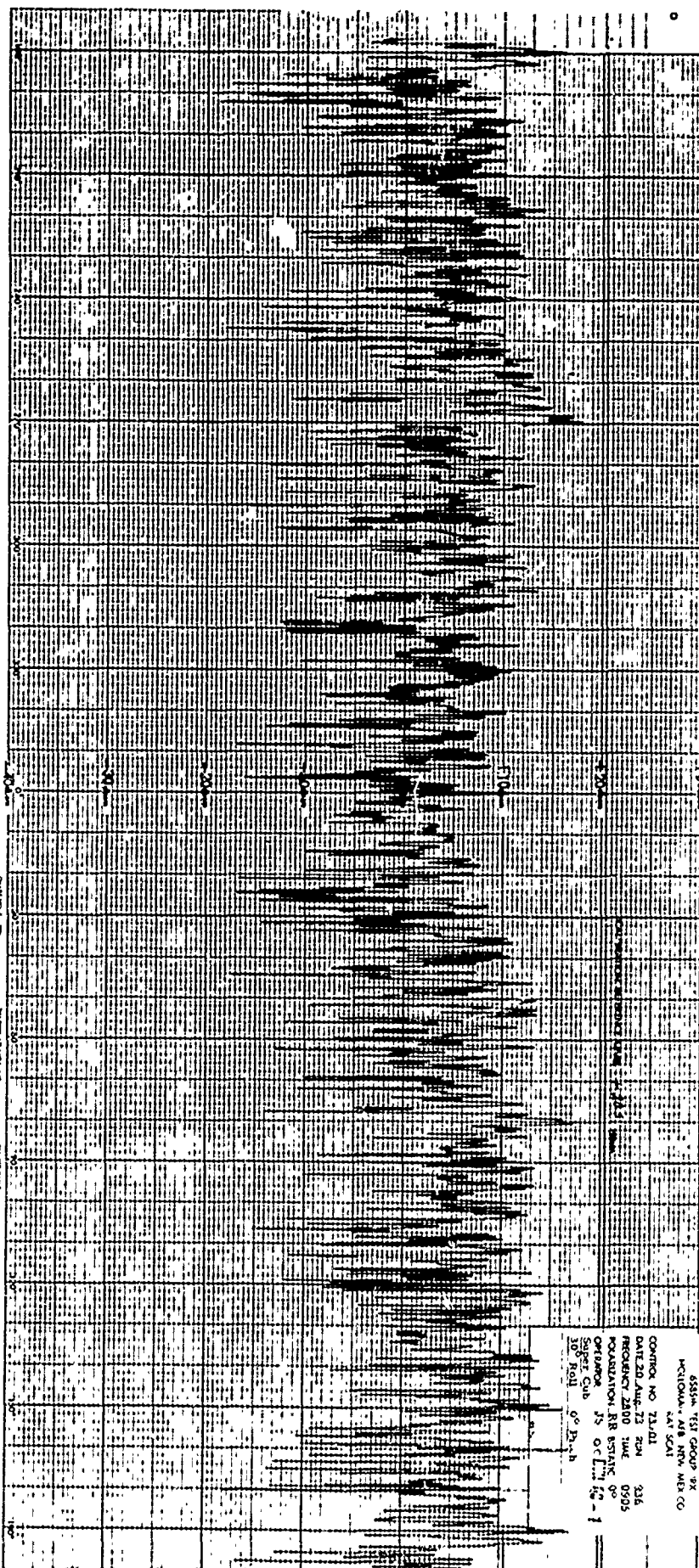
8550 1151 GROUP 111
HOLDING 1151, NEW MUSIC
PAT SON
CONTROL NO. 71-01
DATE 24 Aug 73 .PMV -1151
FREQUENCY 2800 IWL 1220
POLARIZATION AIR 051A100
OPERATOR 1151 05-0111 05-1
SUPERVISOR
20th Holl 110-2111b



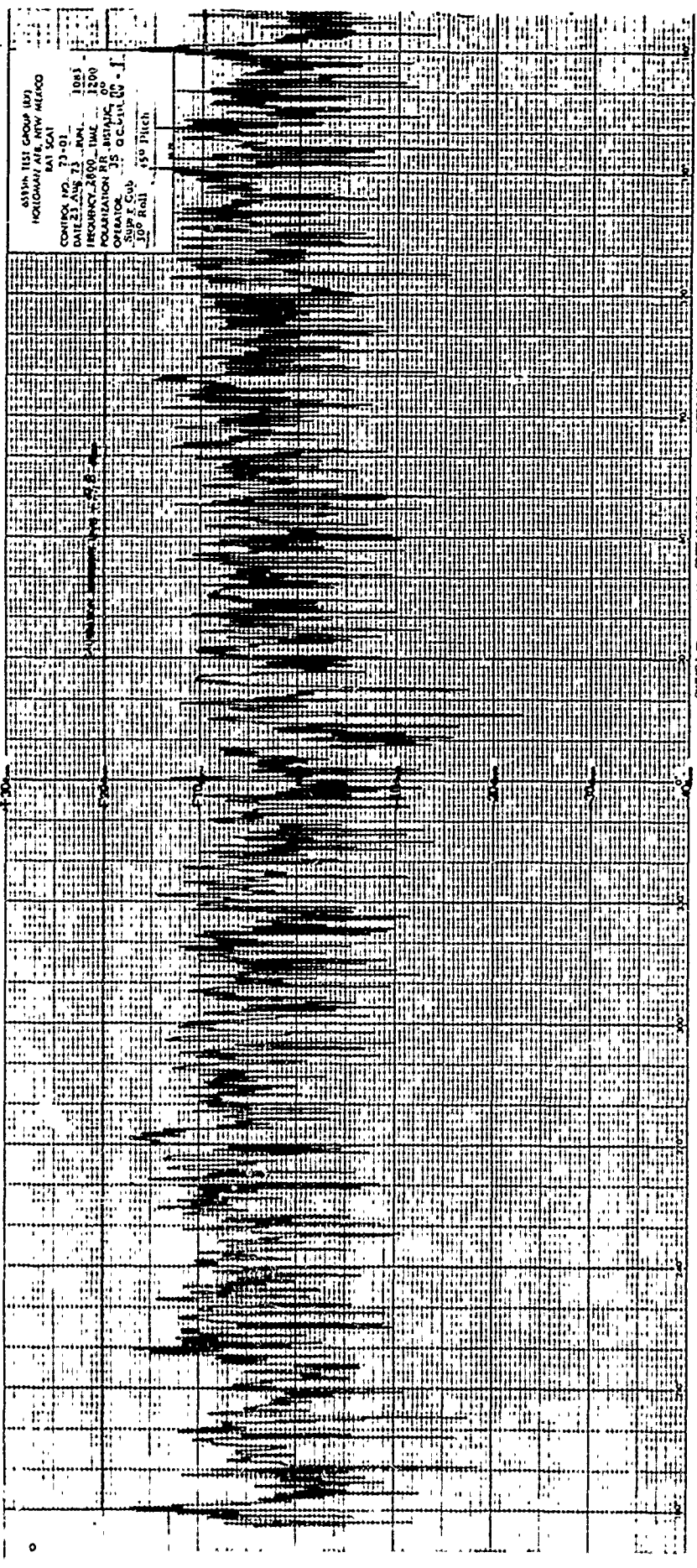




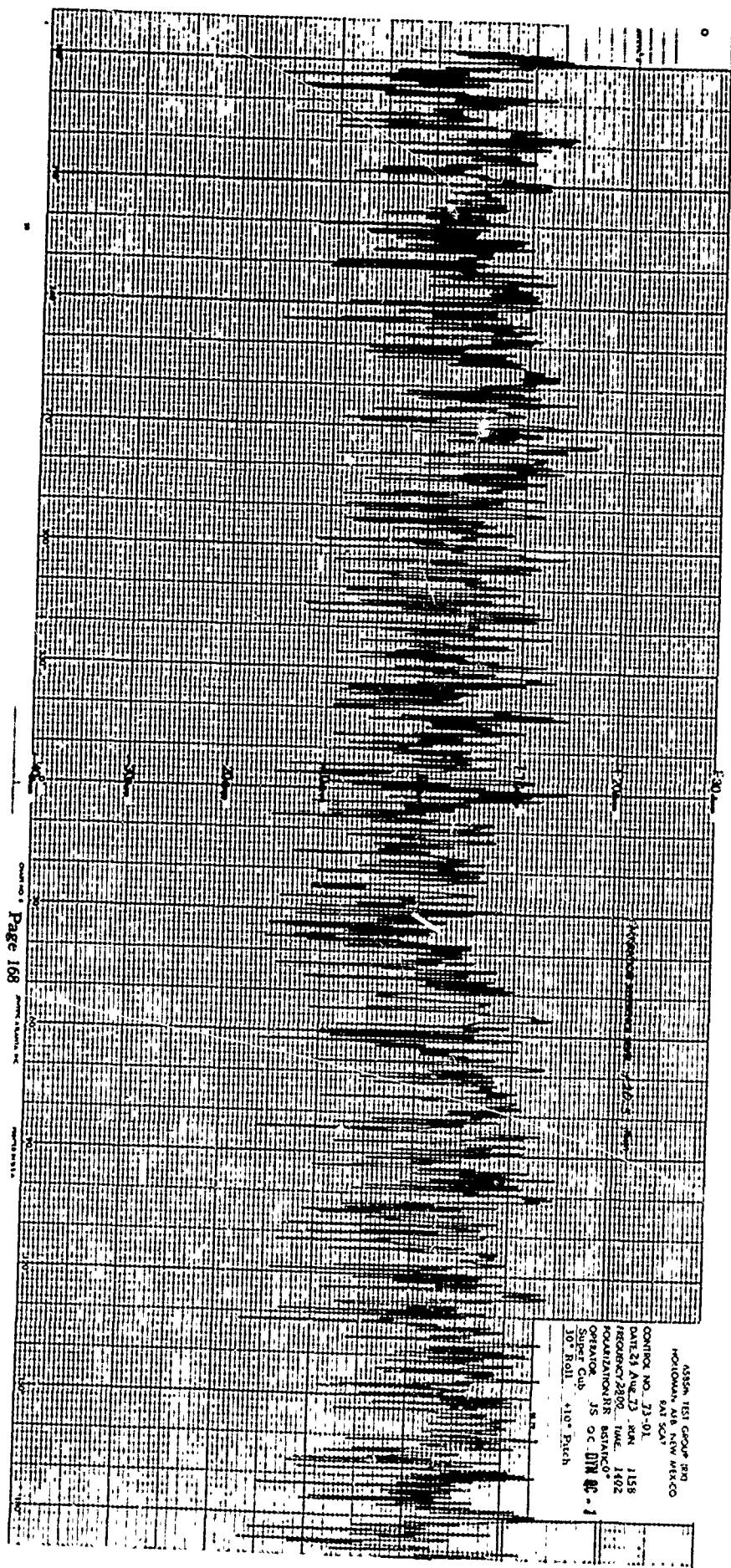
651m TEST GROUP JPN
HOLLOMAN J28 NEW MEXICO
SAT SCAT
CONTROL NO 73-01
DATE 23 AUG 73 RUN 1071
FREQUENCY 2800 MHz 1000
POLARIZATION RSTALIC 00
OPERATOR J2 OC-DIN SC
Super. Club
J2C-B311 50 Patch



65544 TEST GROUP 2X
 MCILLOUGH, AIR NEW MEX CO
 LAT 30N
 CONTROL NO 11-01
 DATE 20 AUG 73 RUN 336
 FREQUENCY 2500 TIME 0905
 POLARIZATION RB ESTAB 00
 OPERATOR JS O'LEARY
 SUPER GUB 00 12-11
 10 Roll 00 12-11

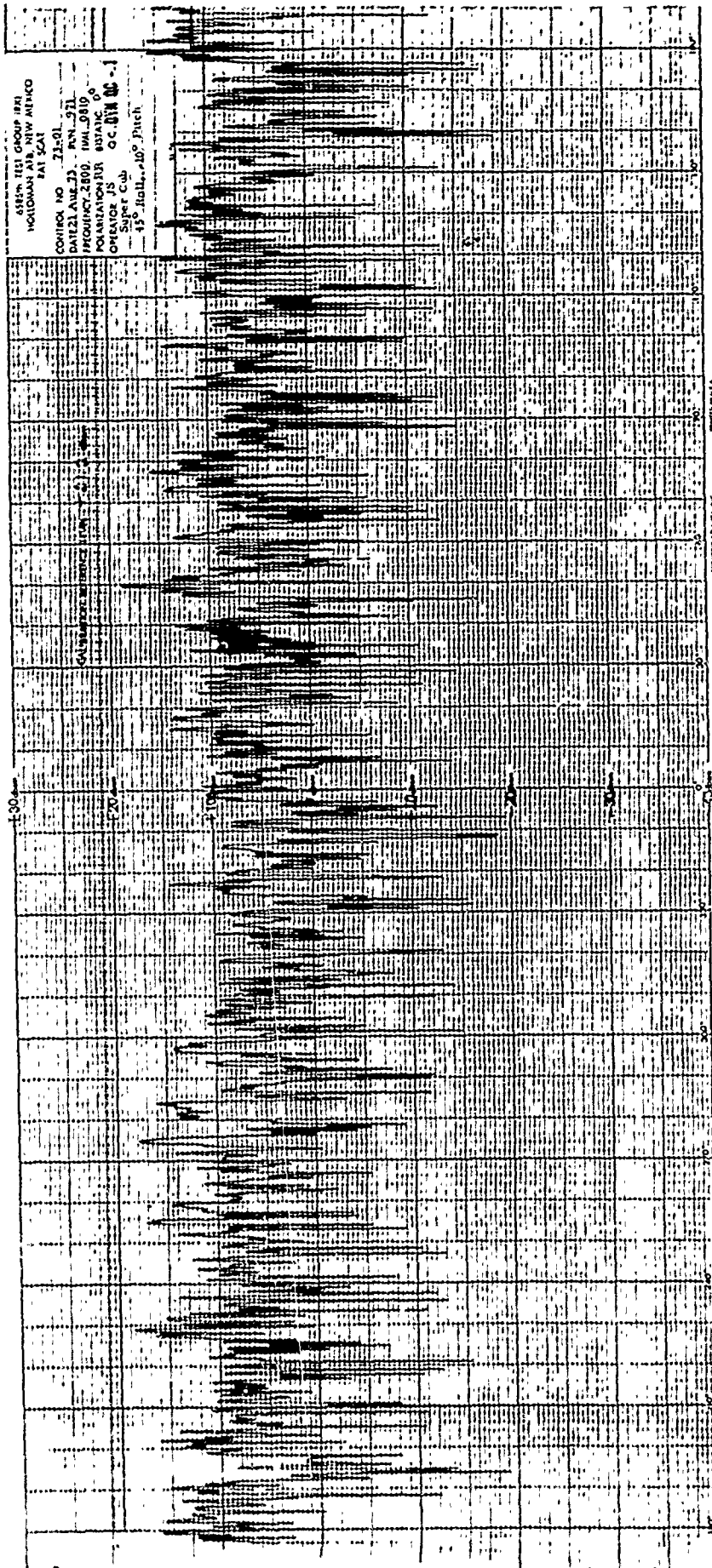


65534N TEST GROUP (B2)
HOLLOMAN AFB, NTW ALKCO
RAT SCAT
CONTROL NO. 73-01
DATE 21 AUG 73 - JRM
FREQUENCY 2800 - TIME 1200
POLARIZATION RR - INITIAL 00
OPERATOR JS O.C. 111. 00 - J
Sup J Cup
100 Roll
150 Pitch



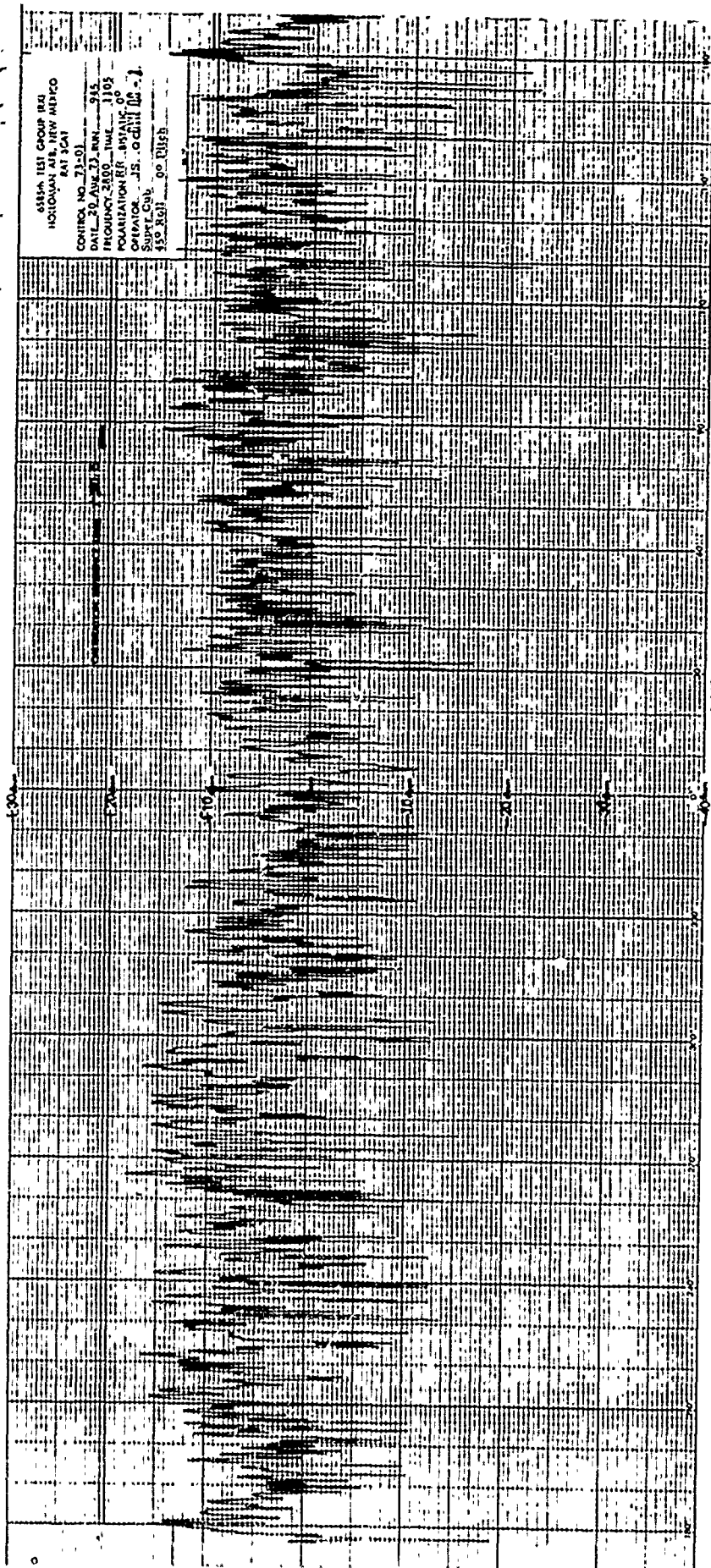
Page 168

ASSN 151 GROUP 301
 HOLLAND, AIR NEW MEXICO
 SAT SCAT
 CONTROL NO. 23-01
 DATE 21 Aug 73 - 155
 FREQUENCY 2800 - 1402
 HORIZONTAL DISTANCE
 OPERATOR JS OC DTM 40-1
 SUPER CUB
 10" Roll 410" Pitch



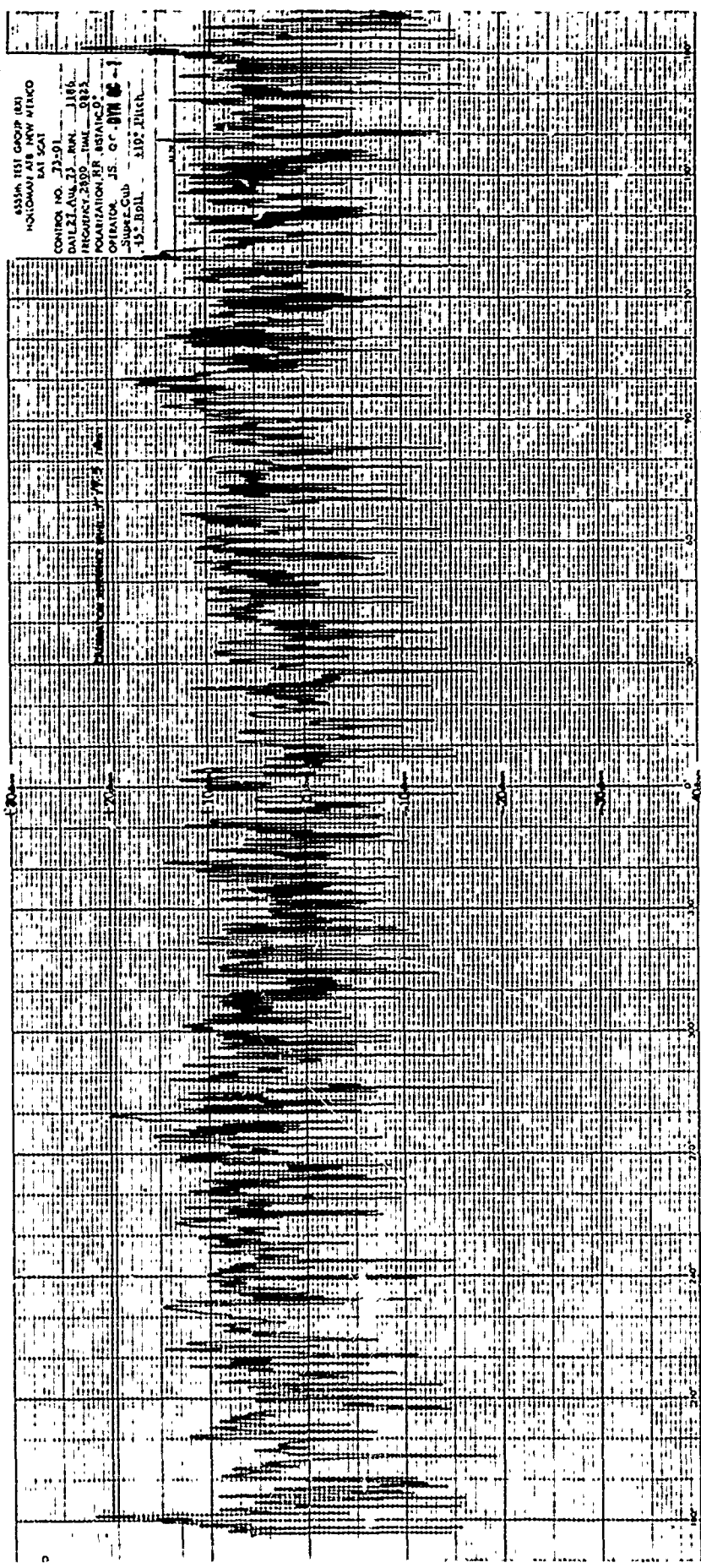
6185N TEST GROUP 18A1
HOLDMAN AT NEW ARTHCO
SAT 50A
CONTROL NO 72-01
DATE 21 AUG 55 - PAV 371
FREQUENCY 2800 - 1041.9810
POLARIZATION 100
ORIENTOR 70 GC 01A 00-1
Super Cub
15° Roll, 10° Pitch

658PM 1511 GROUP 830
HOLLOMAN AFB, NEW MEXICO
FBI SCAT
COMPO NO 23-01
DATE 20 AUG 11 PM 350
RECEIVED 2800 TIME 1240
ORGANIZATION R.R. ASIANIC 00
OFFICE JS OC DM GC-1
Super Cub
45° Roll 40° Pitch

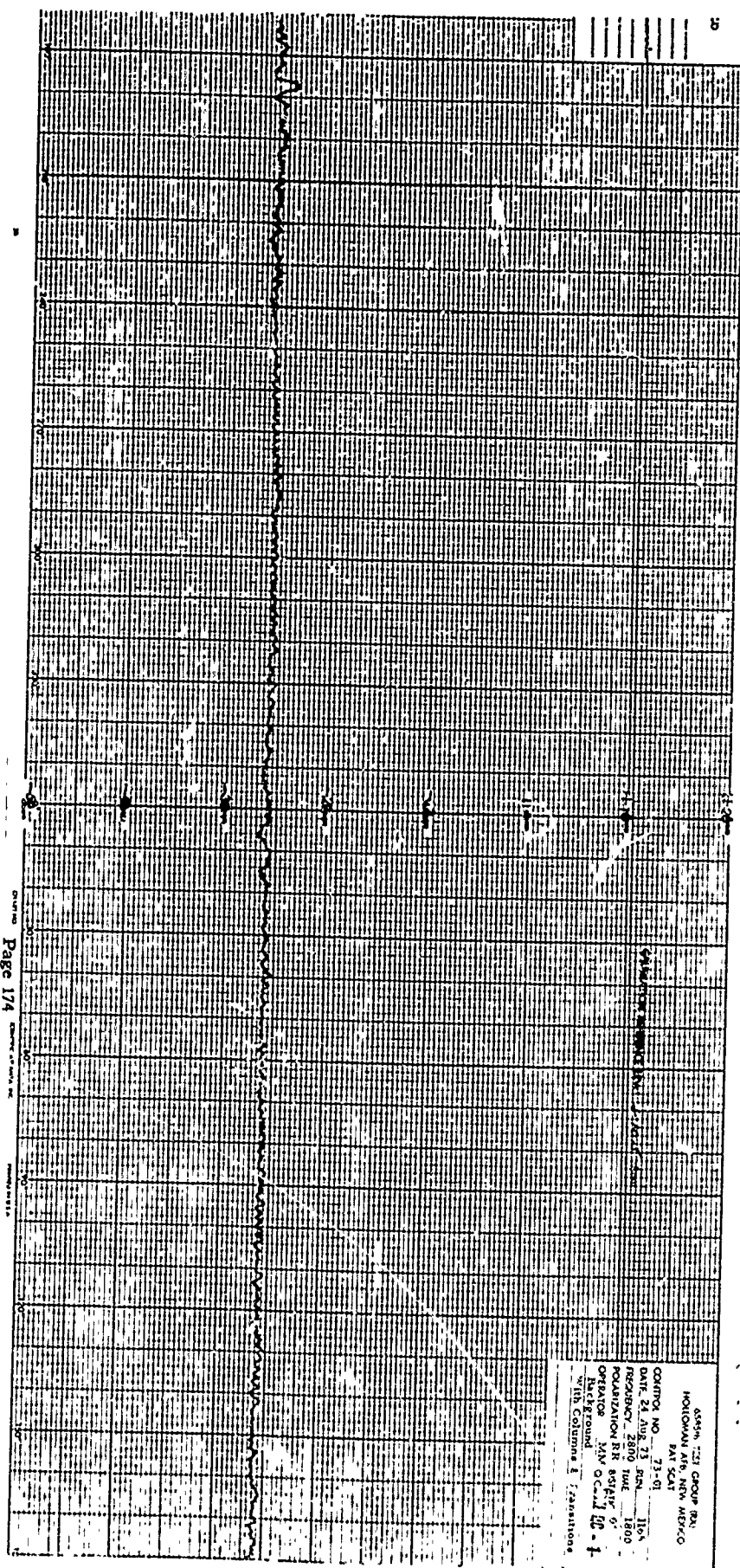


6554A TEST GROUP 183
HOLLOMAN AFB, NEW MEXICO
RAT 3041
CONTROL NO. 71-01
DATE 20 Aug 73 RUN 245
FREQUENCY 2000 TIME 1105
POLARIZATION RF ANTENNA 00
OPERATOR J.S. OCHILLY
SUPERVISOR 150 3041 00 01258

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ASIA TEST GROUP (AT)
NATIONAL AIR FORCE (NAF)
SAC (AT)
CONTROL NO. 23-91
DATE: 11/11/51
PROJECT: 100-100-100
OPERATOR: J. G. 011 6-1
SUPERVISOR: J. G. 011 6-1
15-0001 - 110-1100

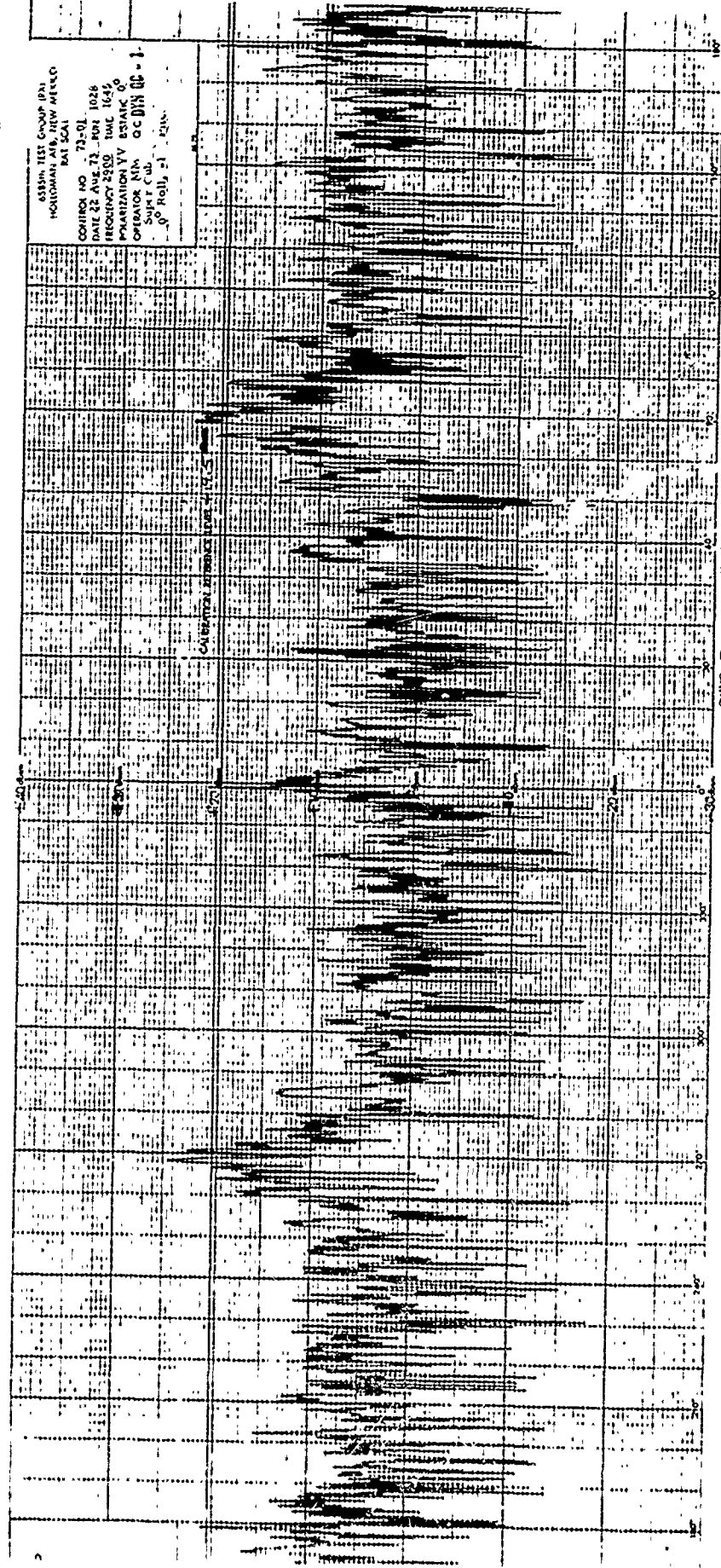


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6554h, 23 GROUP BAI
 HOLLAND AIR, NEW MEXICO
 BAI SCAT
 CONTROL NO. 73-01
 DATE 24 AUG 73 RUN 11-0
 FREQUENCY 2800 HUE 1800
 POLARIZATION RR 8541V 9
 OPERATOR MM O C 1 10 - 1
 Background
 With Columns 1 / transitions

6585th TEST GROUP (PAT)
HOLLANDMAN AFB, NEW MEXICO
RAT SCAL

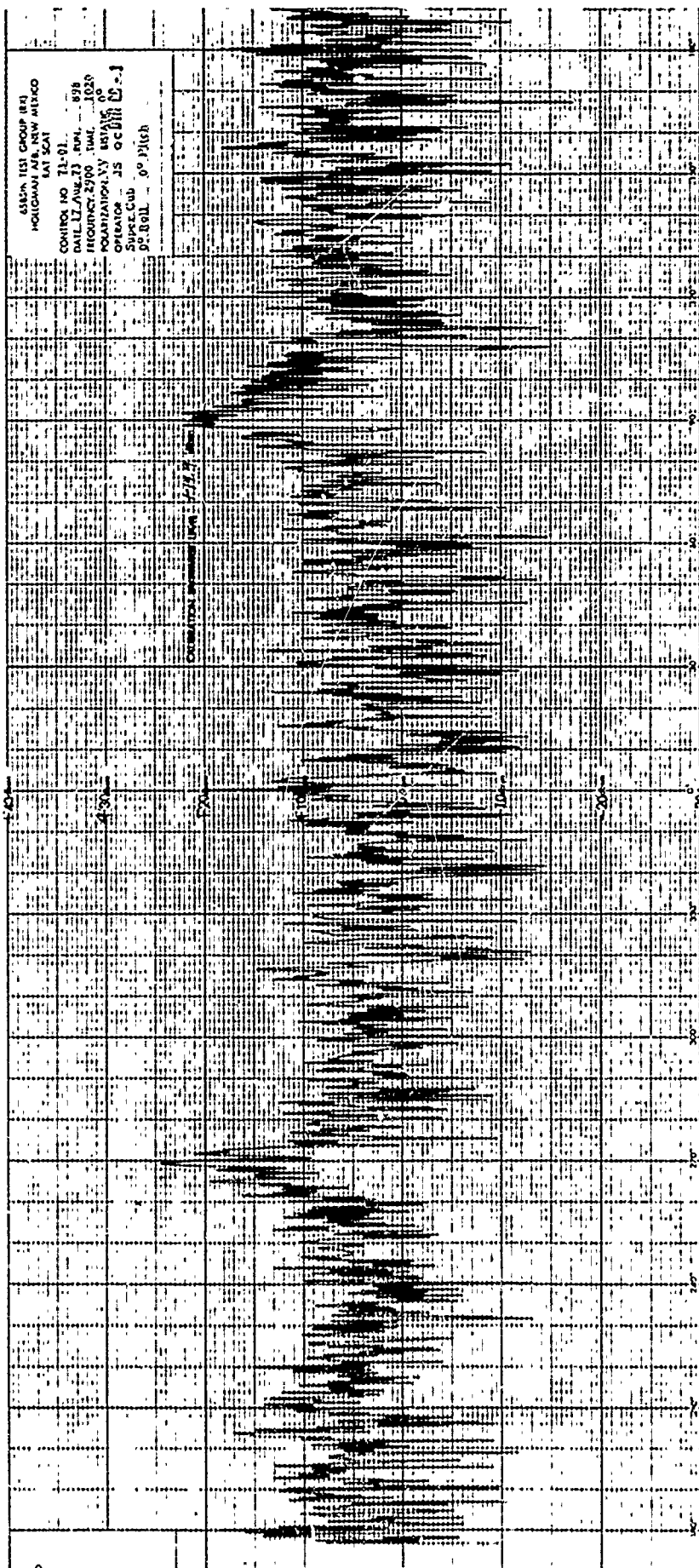
CONTROL NO. 73-01
DATE 22 AUG 73 FMT 1028
FREQUENCY 2900 TMC 1645
POLARIZATION VV STATIC Q
OPERATOR MM QC DYN QC
Super Cub
0 Roll, 0 Pitch

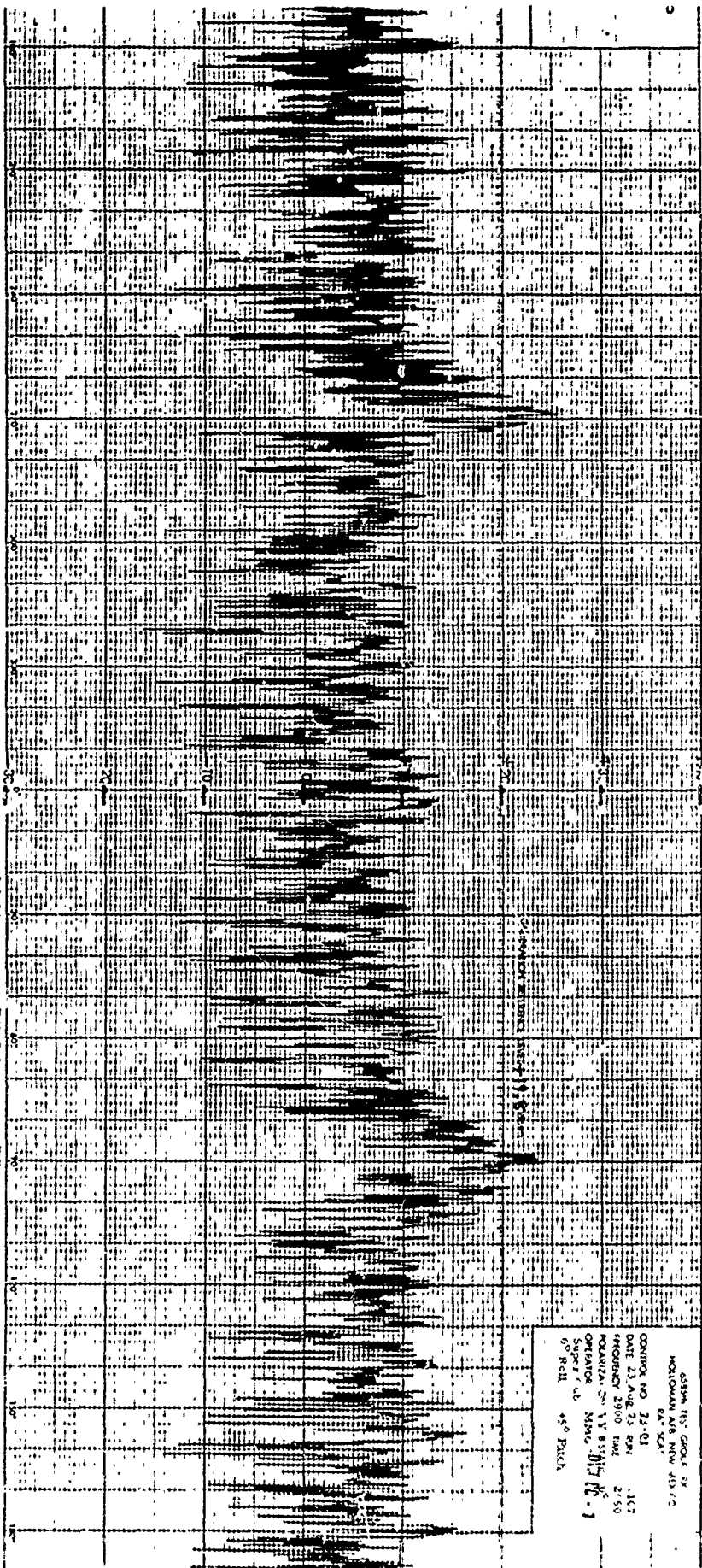


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6582M TEST GROUP (BX)
HOLLAND AFB, NEW MEXICO
EAT SCAT

CONTROL NO 71-01.
DATE 17 AUG 73. FREQ. 825
FREQUENCY 2900. TIME 1020
POLARIZATION VY. ESTATE 0°
OPERATOR JS OGDIN L.
SUPER. GUB
9° 30N - 0° 15W

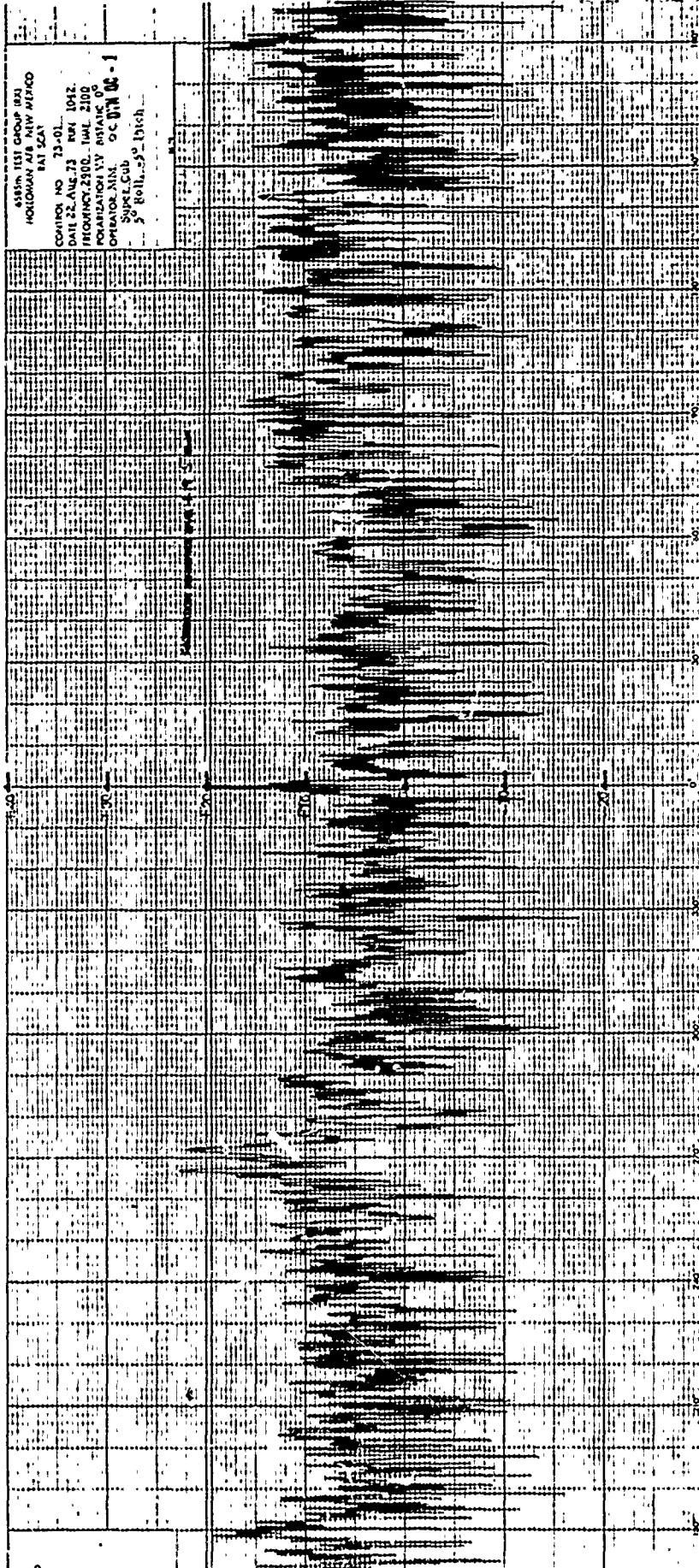




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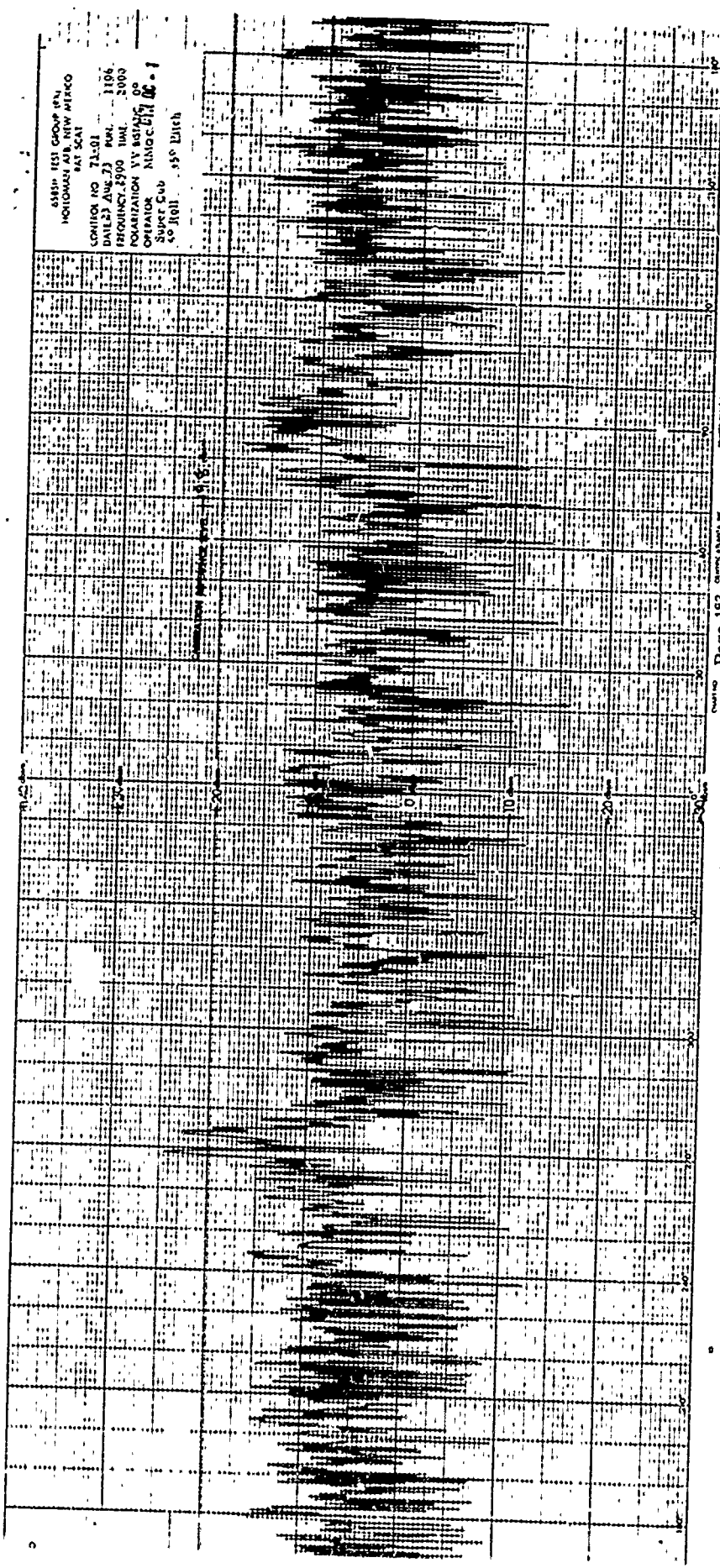
6554H T57 GROUP 27
 HOLLOMAN AFB NEW MX 10
 847 SCA
 CONTROL NO 73-01
 DATE 23 Aug 73 RNM 167
 FREQUENCY 2300 TWT 2750
 LOCALIZATION VY 8550
 OPERATOR NAME 01710-1
 SUPERVISOR
 45° Pitch
 45° Roll

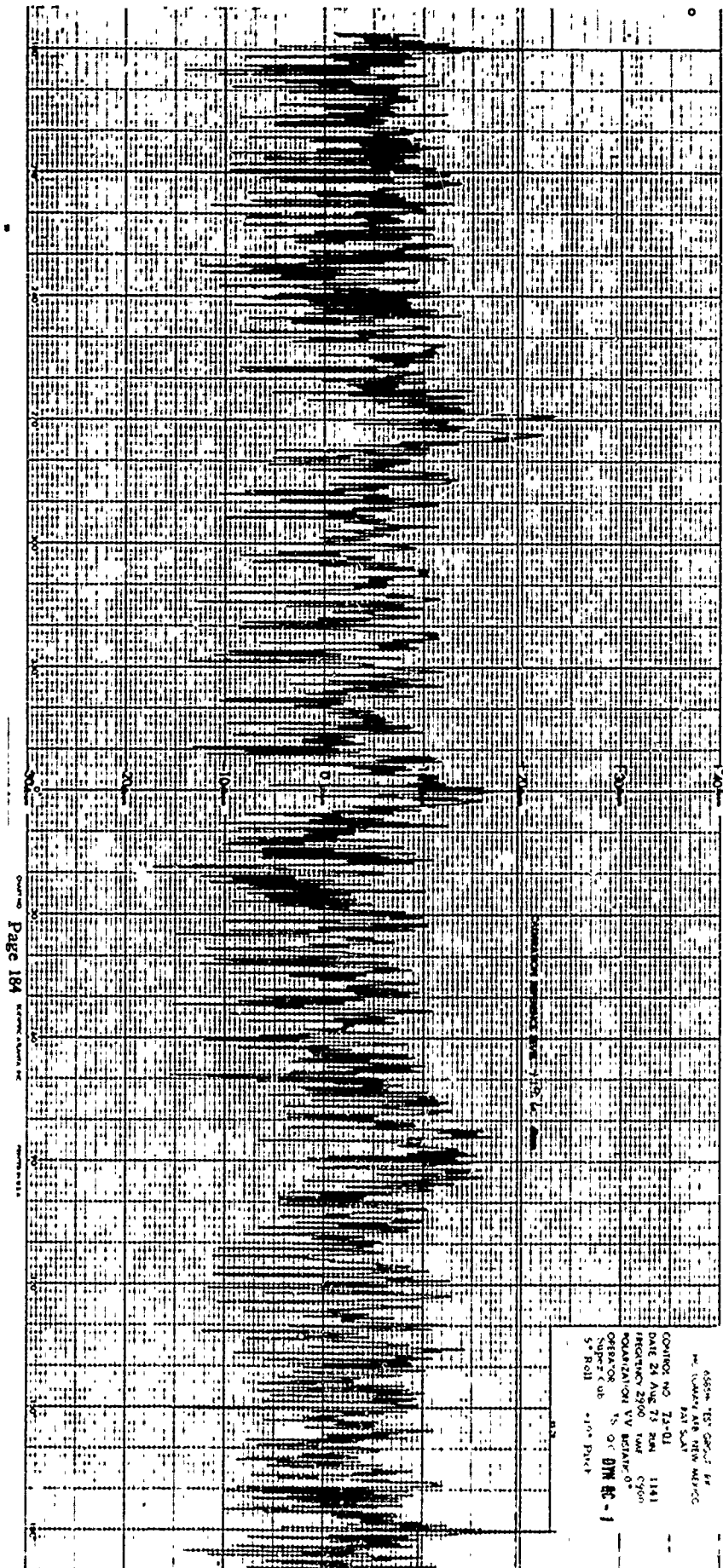
Page 180



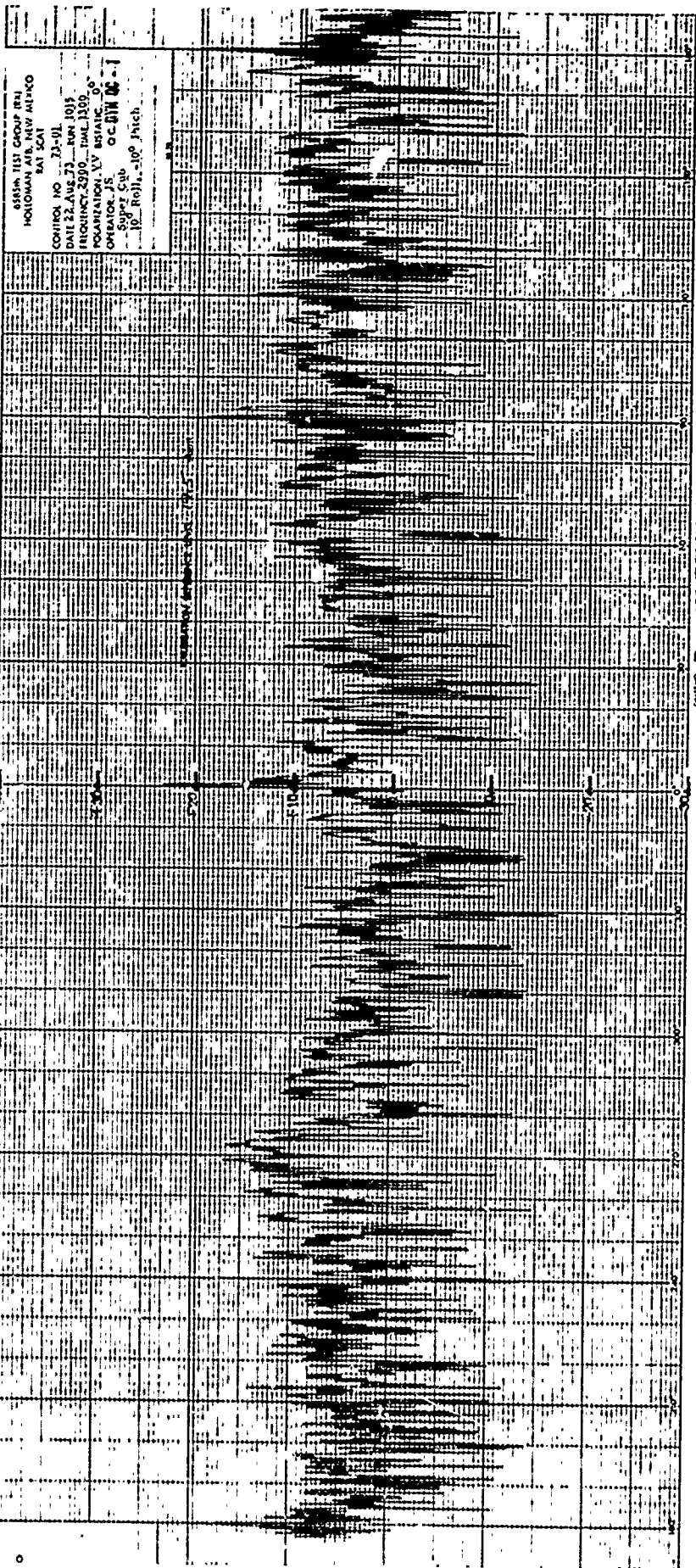
0520H 1231 GROUP MAY
HONOLULU, AIR, NEW MEXICO
04 5041
CONTROL NO 11-01
DATE 1 Aug 73 P.M. 899
FREQUENCY 2500 TWT 1210
MODULATION TV STATIC CO
ORIGINATOR JS OC DTR DE - 1
50 1000 00 Patch

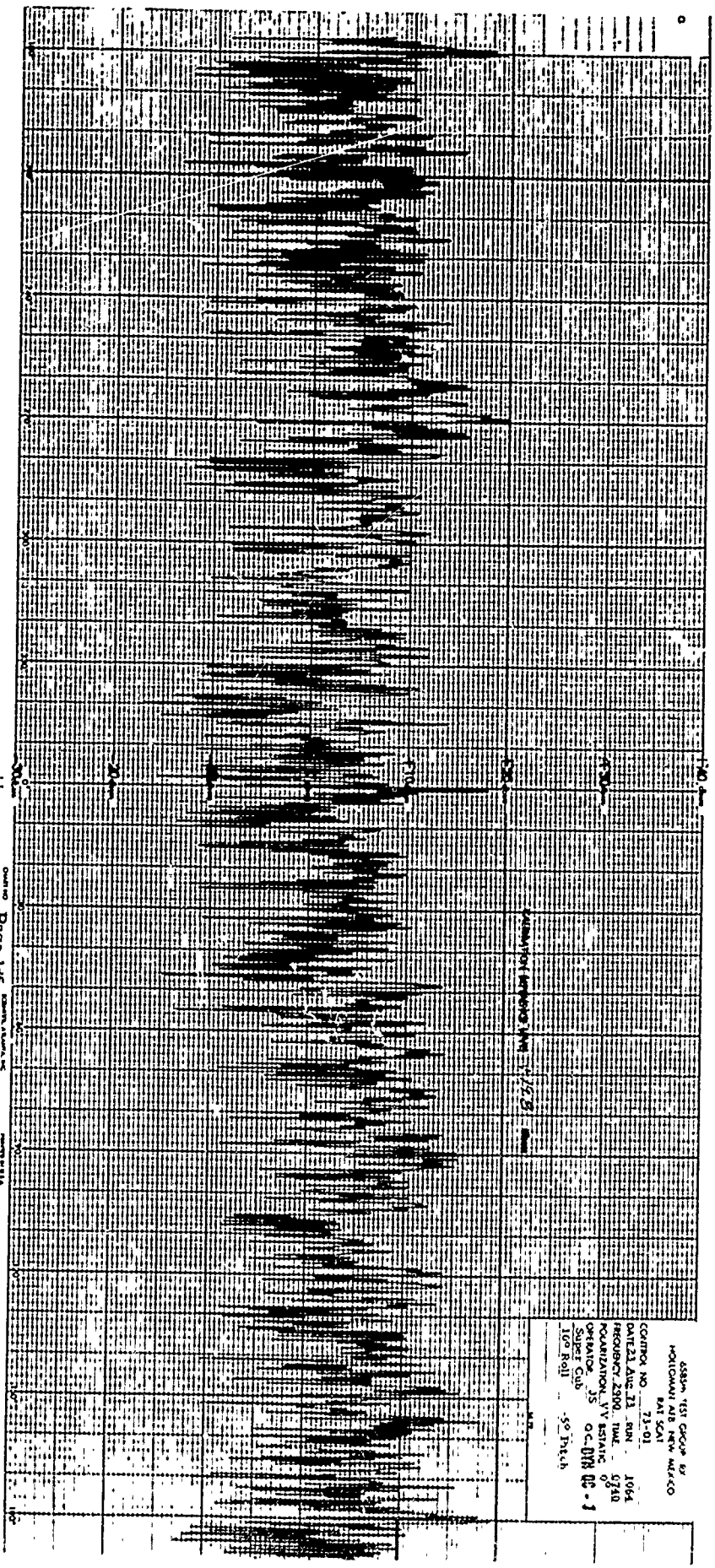
535th TEST GROUP (PN)
HOLLOMAN AFB, NEW MEXICO
BAT SCAT
CONTRON NO 71-01
DATE 23 AUG 73
FREQUENCY 2900 MHz
POLARIZATION VV
OPERATOR NMDCC
SQUAD 50
CO TELL 550 Ditch





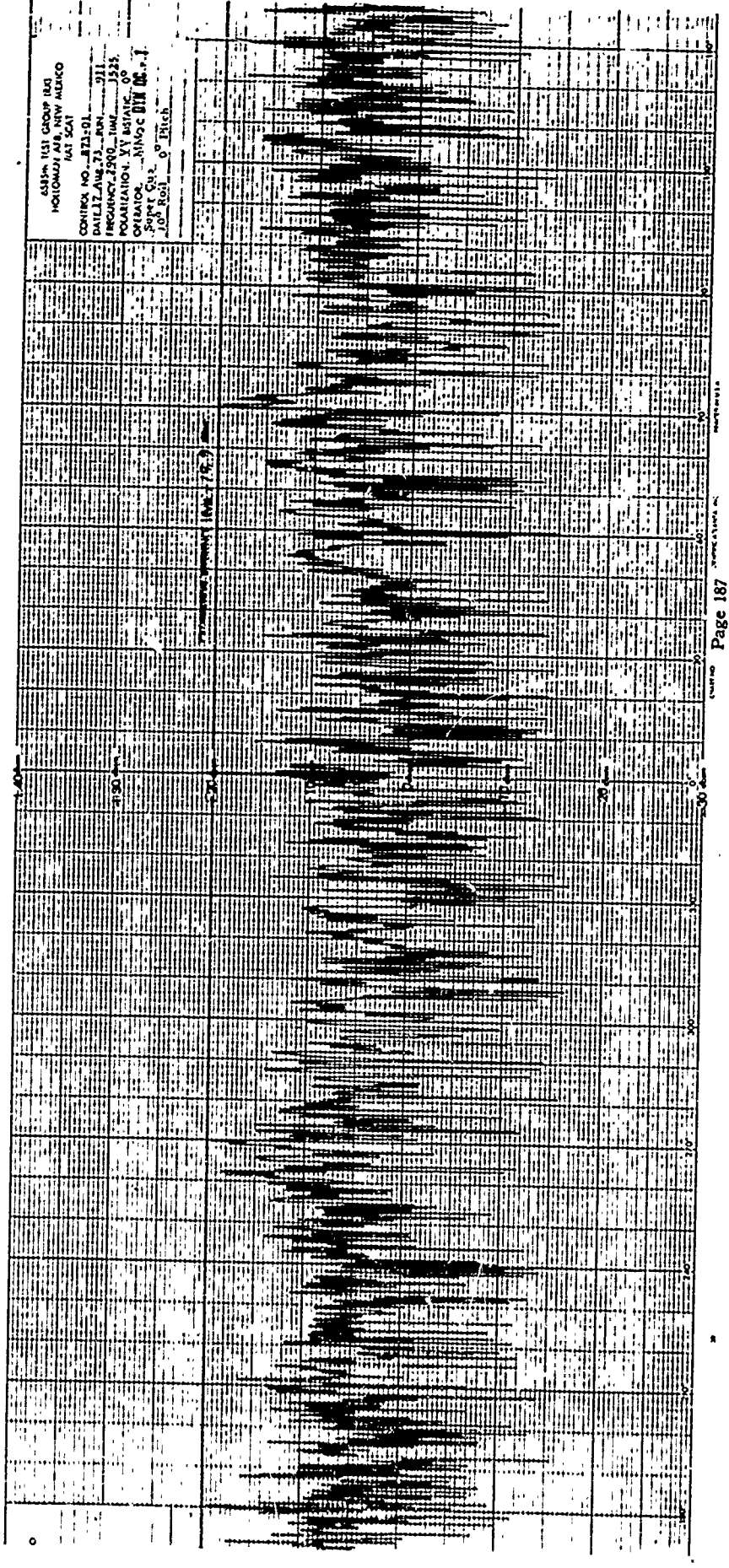
ASSIGNED TO GROUP 1 BY
 THE COMMANDER AND NEW MATRONS
 AND SGT
 COMPANY NO 72-01 1141
 DATE 24 Aug 72 104 5900
 POSITION 2200 104 5900
 LOCATION 01 YV 0214100
 COMMENTS 15 01 01M EC-1
 5th Roll 10th Pwr

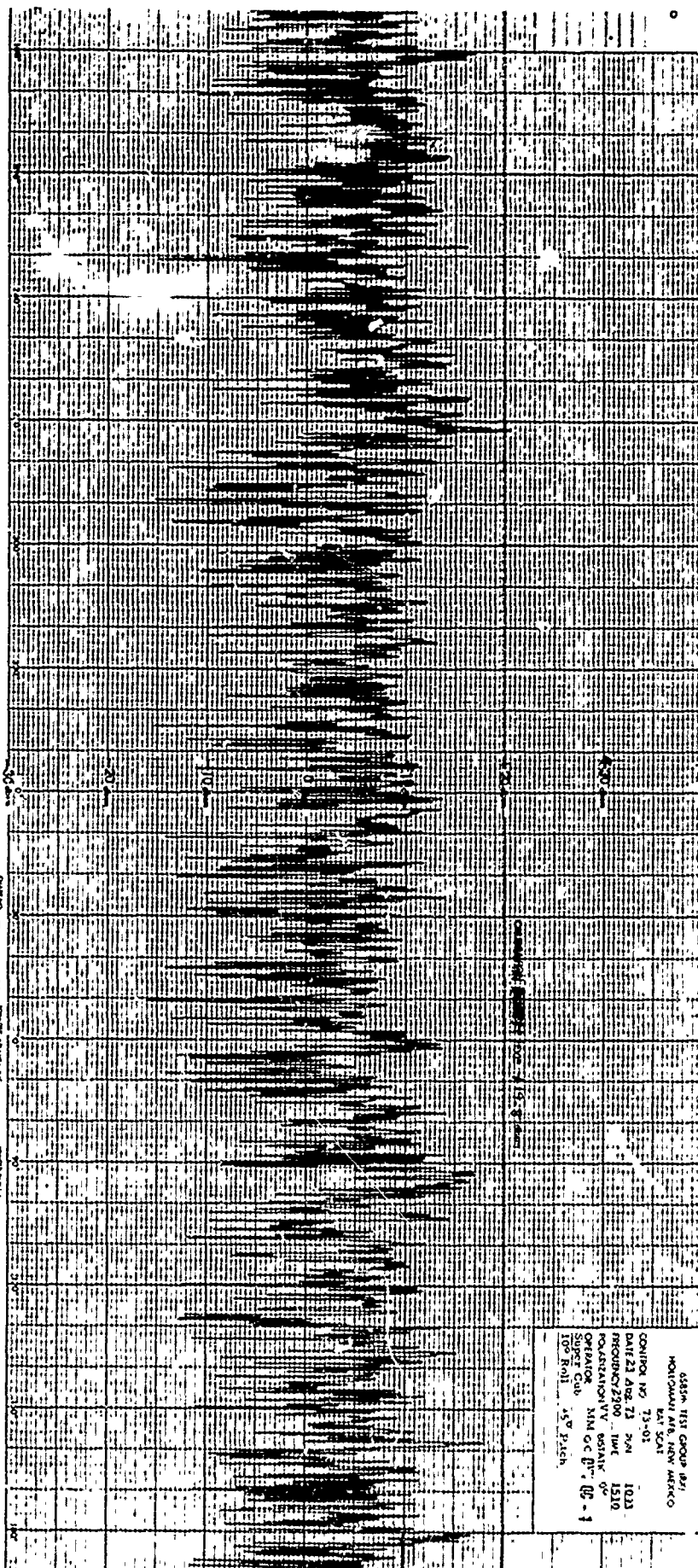




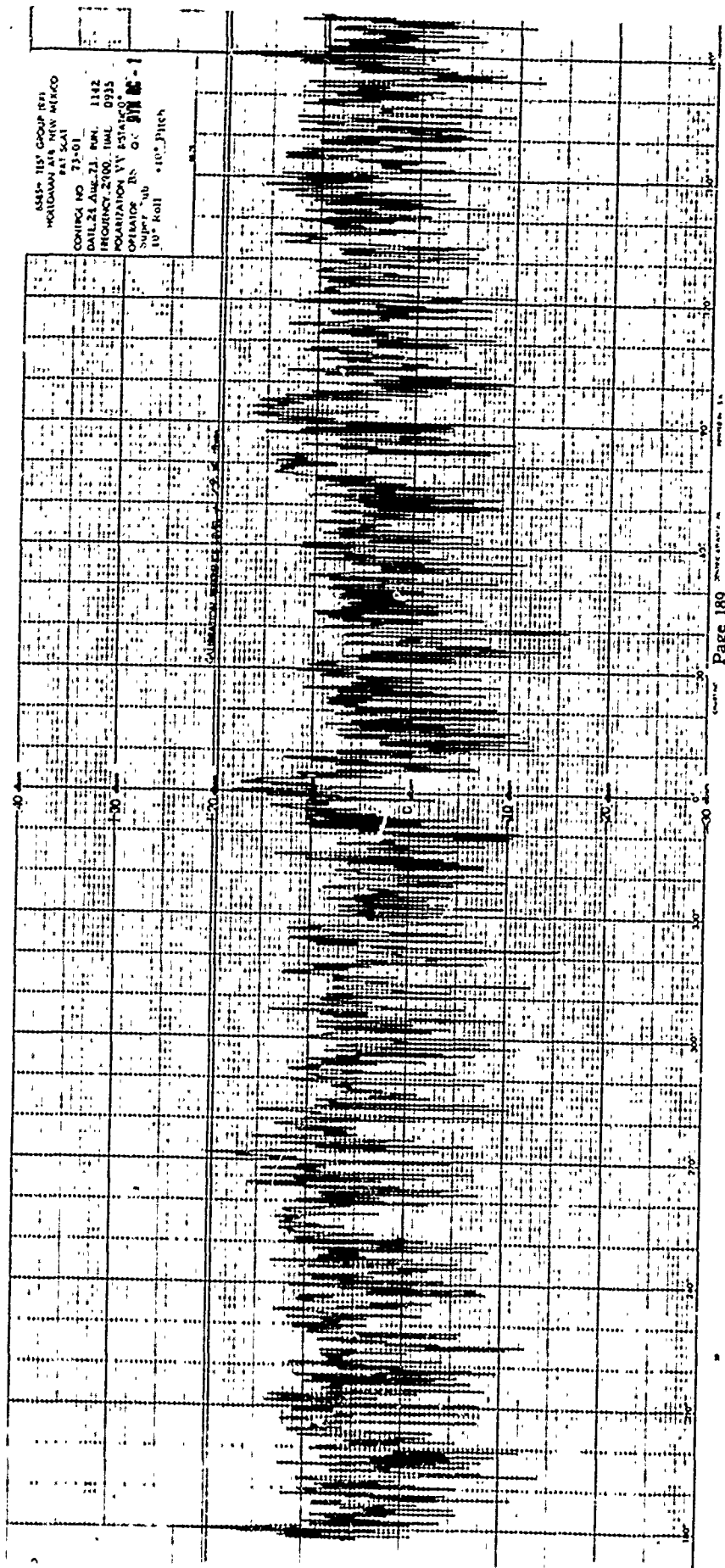
688th TST GROUP BY
HOLLOMAN AB NEW MEXICO
BAT SCAT
CONTROL NO. 73-01
DATE 21 AUG 71 RUN 1064
FREQUENCY 2300. TIME 0740
LOCALIZATION IV ESTIMATE
ORIENTATION 35 OC. DATA 02 - 1
SUPER CUB
100 Roll
-90 Pitch

6354 1131 GROUP 181
HOLCOMB AFB, NEW MEXICO
IAT SCAT
CONTROL NO. 173-01
DATE 17 AUG 70 RUN 911
FREQUENCY 2900 TIME 1525
POLARIZATION XV STATIC 0°
OPERATOR NING C DIN DC-1
Super Cat
10° Roll 0° Pitch

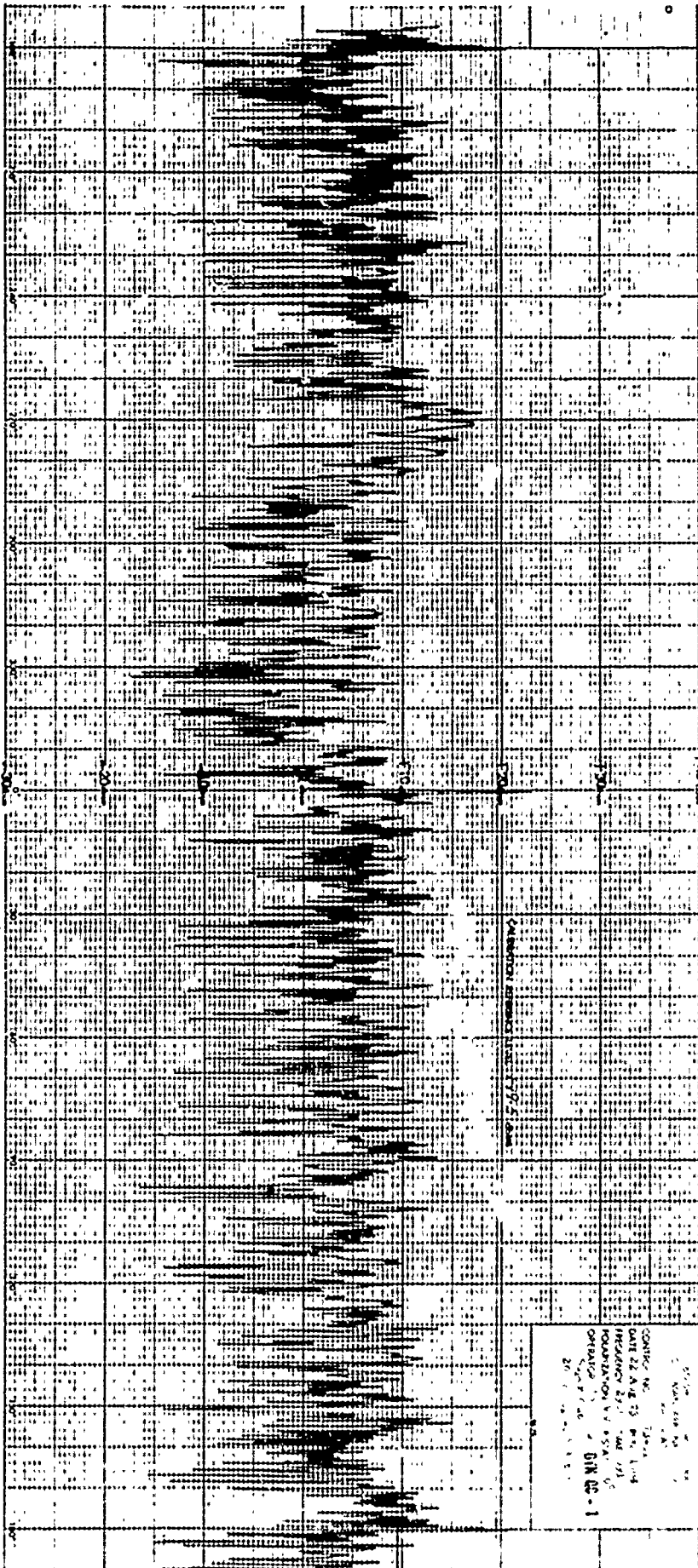




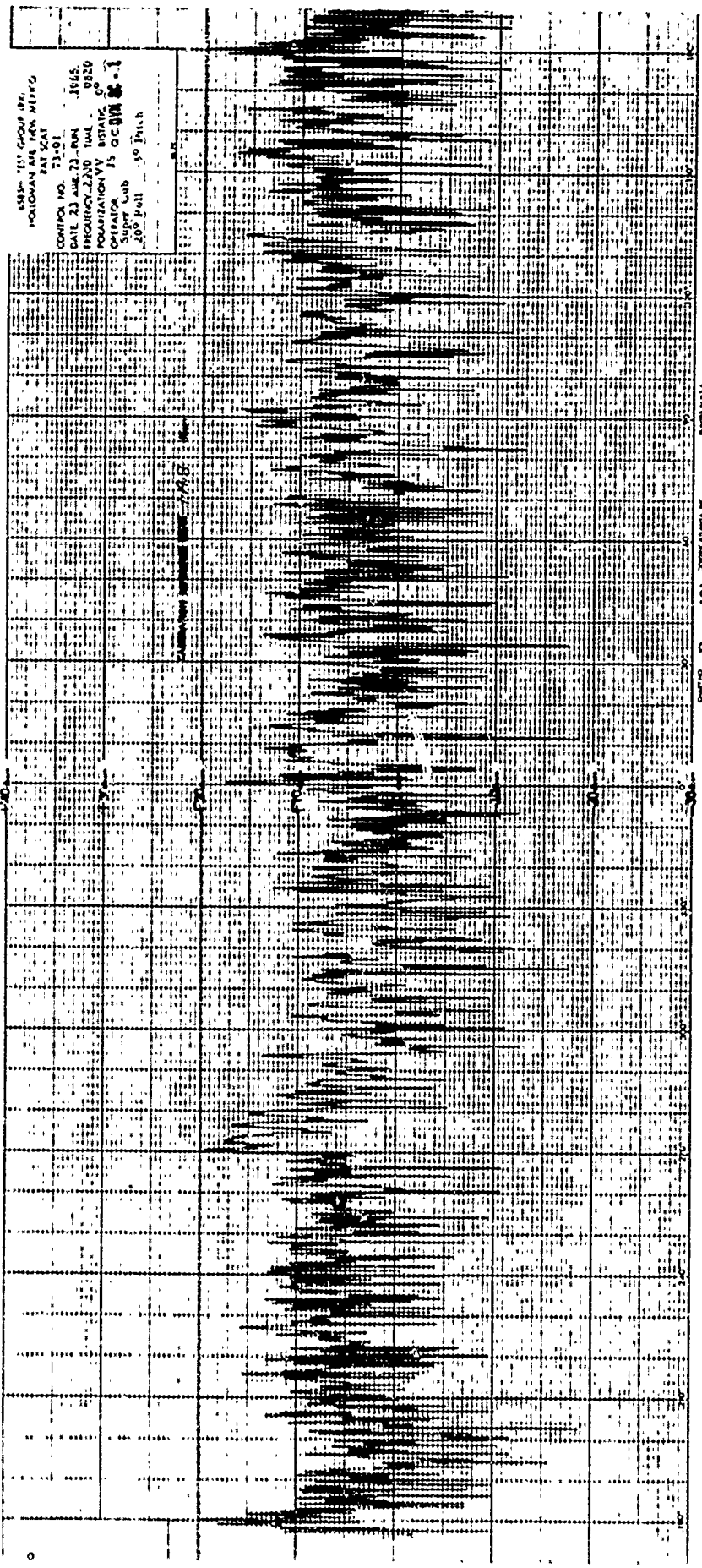
655th TEST GROUP B-1
HOLCOMB AFB, NEW MEXICO
EAT SCAT
CONTROL NO 73-01
DATE 23 AUG 73 PUN 1023
FREQUENCY 2300 MHz 1510
POLARIZATION VERTICAL
OPERATOR NIM OC B-1
SUPER CLUB 15 P-15
100 Roll 15 P-15



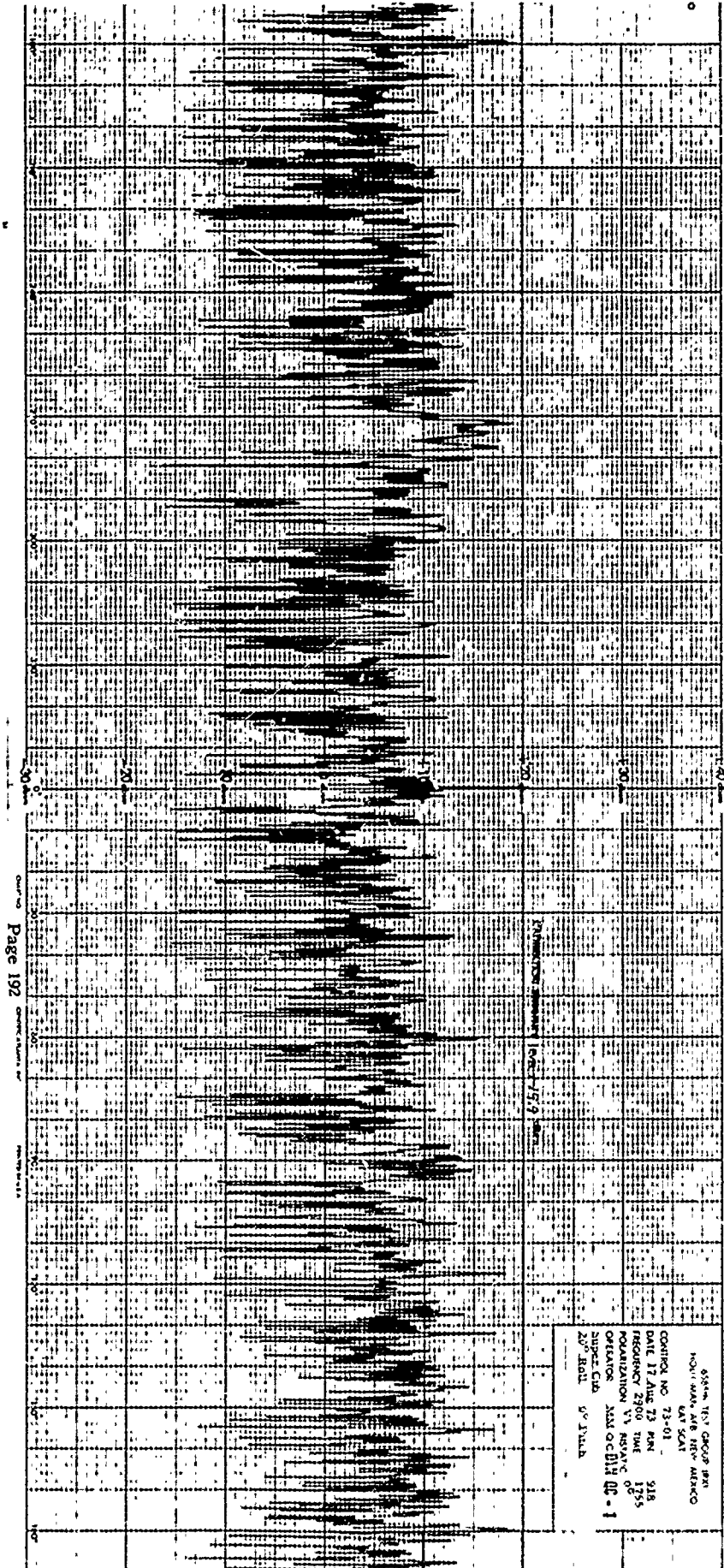
535- 115' GROUP 101
HOLDMAN AIR NEW MEXICO
PAT SCAT
CONTROL NO 73-01
DATE 21 AUG 21 1942
FREQUENCY 2100 - 1000 0935
POLARIZATION VV E514100
OPERATOR BN OC 8111 10-1
10" Roll 110" Pitch



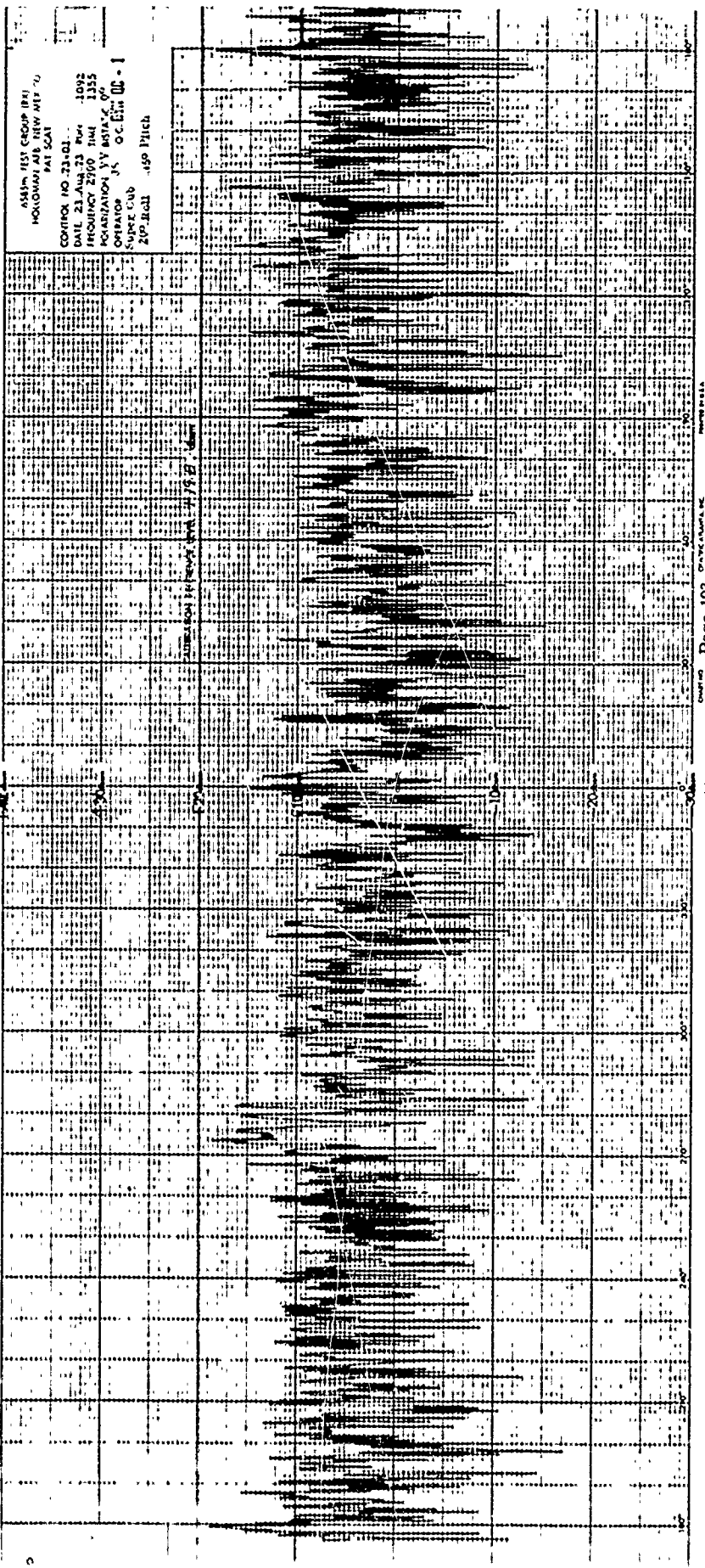
CONTINGENCY NO. 1000
 DATE 22 AUG 59
 FREQUENCY 2000
 LOCATION 1000
 ORIGIN 1000
 01N 00-1



5534-101 GROUP 10
HOLCOMAN AVE NEW MEWS
PAT 541
CONTR NO 73-01
DATE 23 AUG 73 RM 1065
INSTRUC 2ND TIME 0820
POLARIZATION VV INITIAL 00
OPERATOR JS OC 0000-1
Super Lab
200 Roll 50 Inch

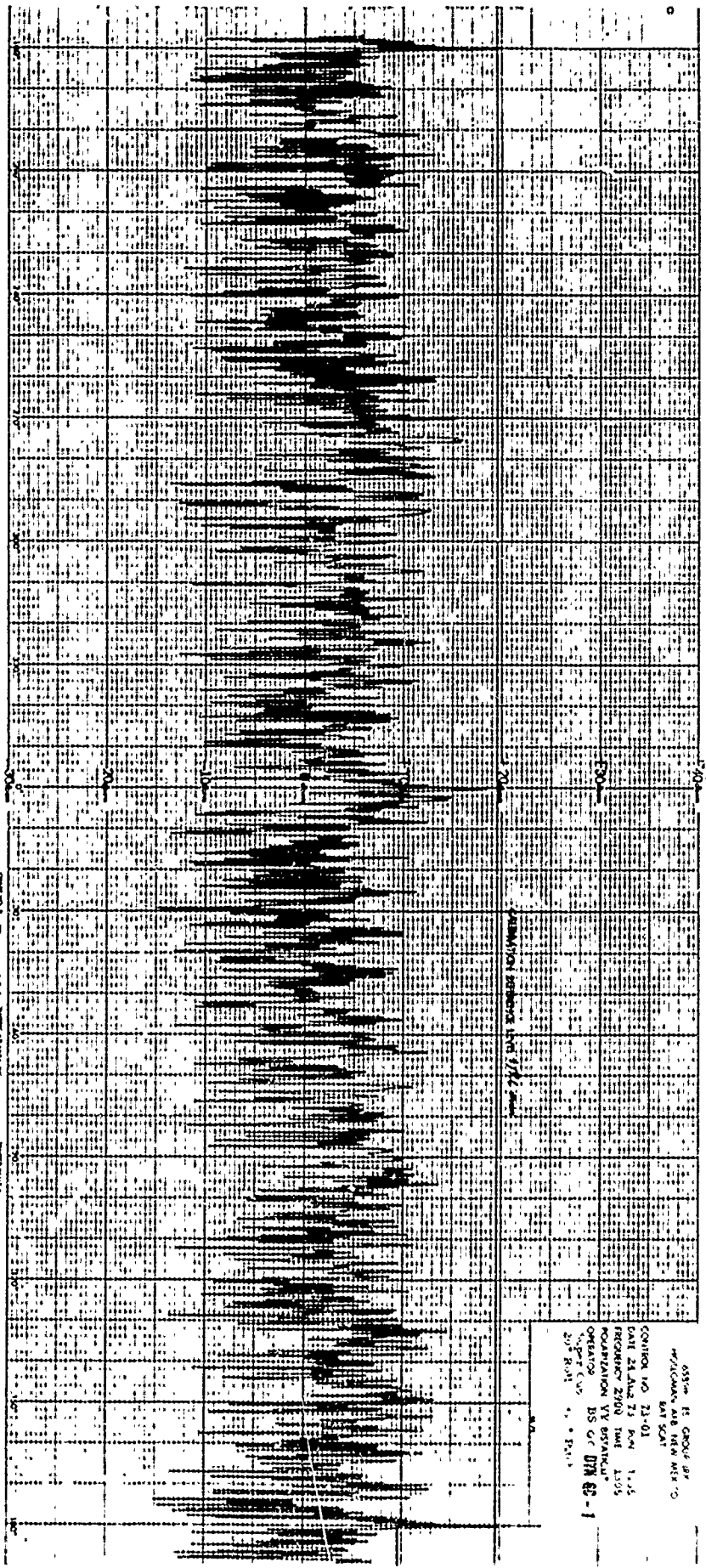


5744 101 GROUP BRT
 NON-MADE NEW MEXICO
 DATE 17 AUG 73 11:18
 FREQUENCY 2701 TUE 10:55
 OPERATOR JSM OC BIA QC - 1
 SUPER CUB 57 111111
 207 Bolt



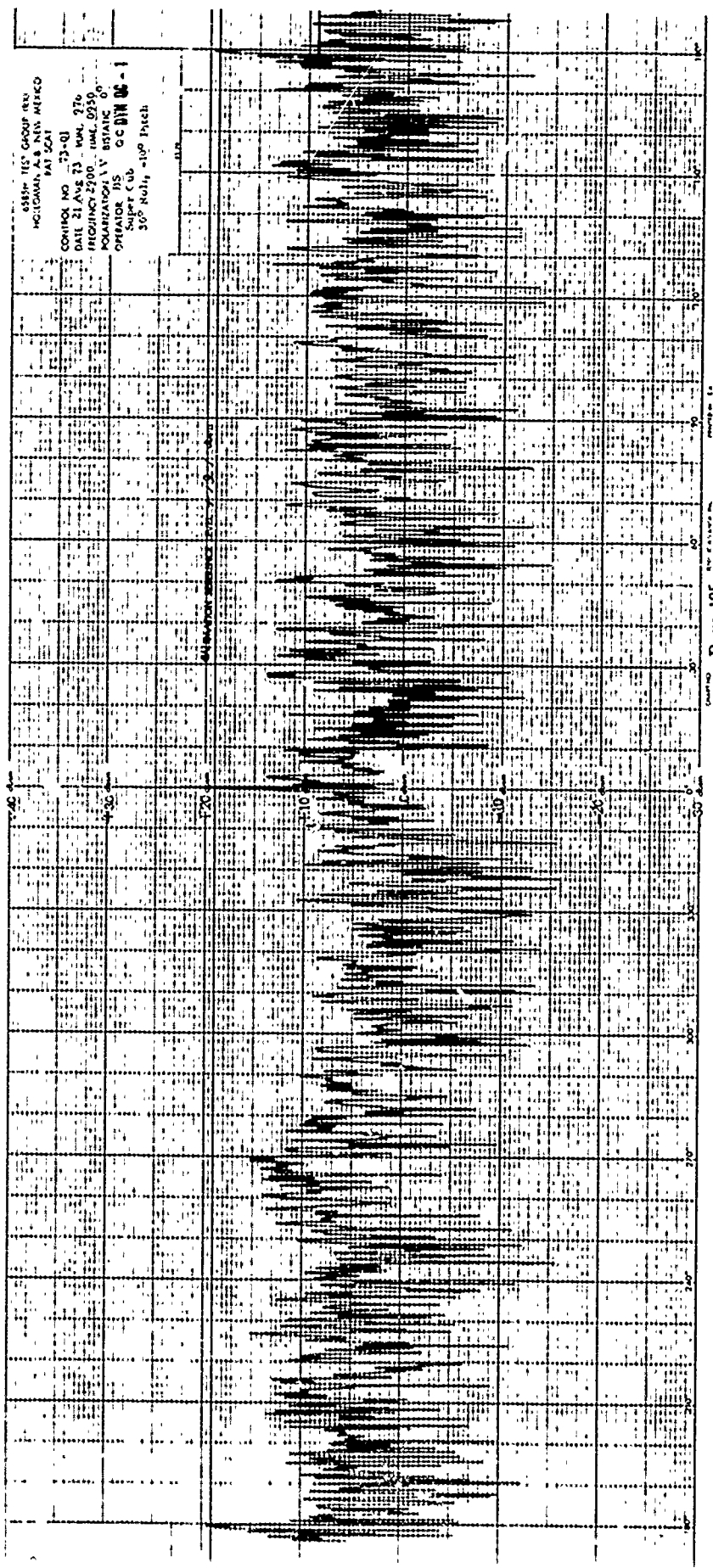
ASAP, 1151 (GROUP 11)
MONITORING UNIT #1770
PAT 5041

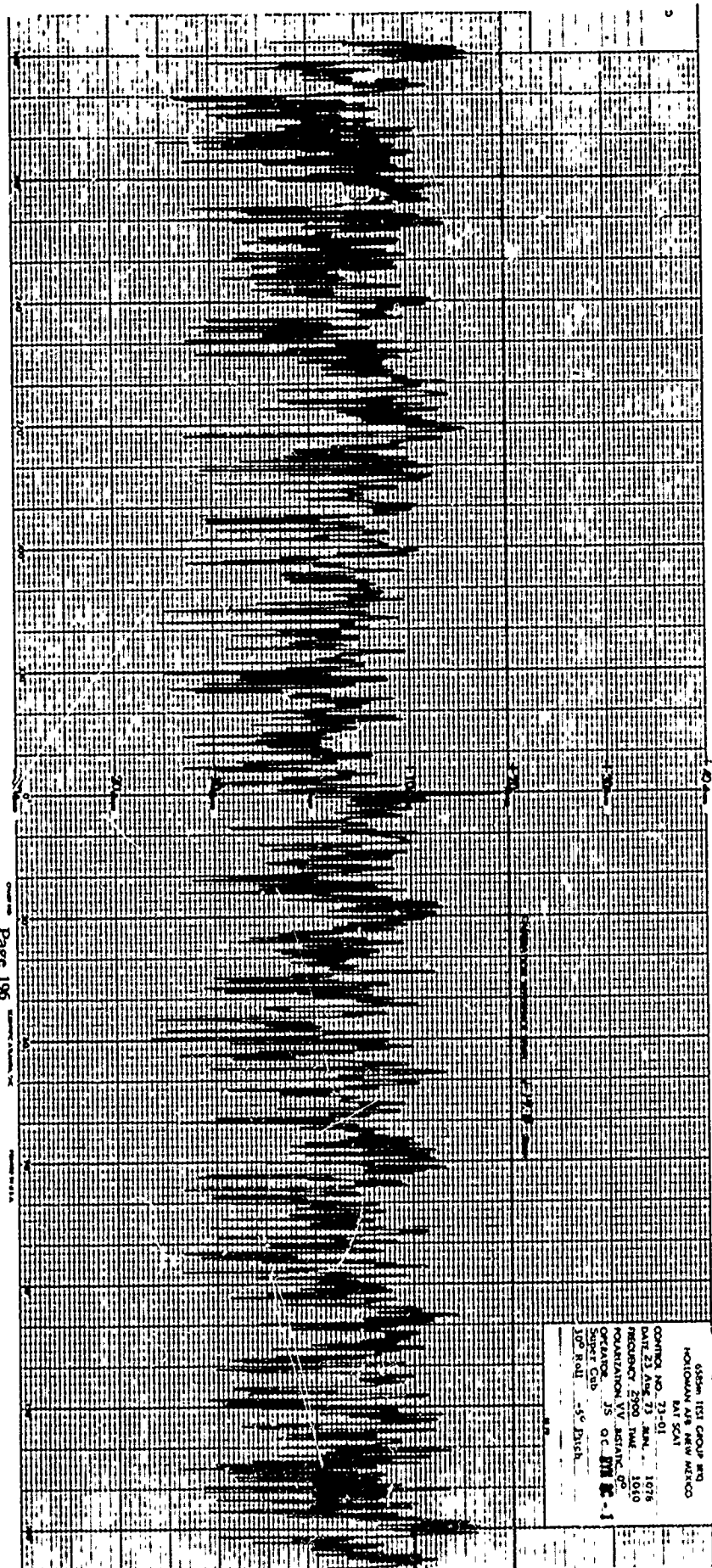
CONTROL NO 21-01
DATE 21 Aug 53 For 1092
PROJECT 2101 For 1355
POSITION 1111 BY 1111
OPERATOR 1111
SITE 1111
2101-01 1111 Pitch



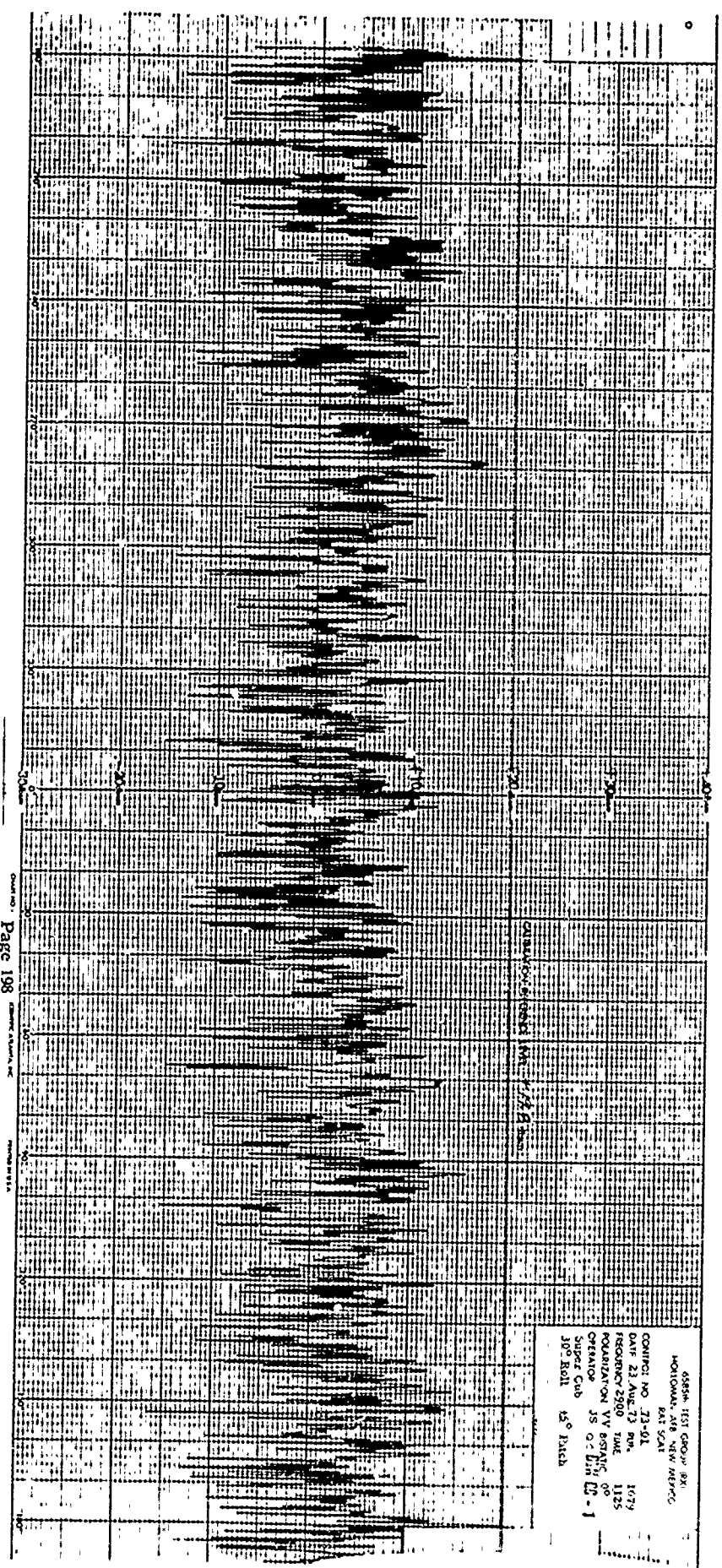
0550 15 GROUP 87
 07/10/00 08 00M 000 70
 001 001
 CONTROL NO. 23-01
 DATE 24 AUG 21 PM 1-5
 PREPARED BY 2000 TMT 1005
 ORGANIZATION VY 0700000
 OPERATOR BS CC DTM 62-1
 001 001
 001 001

6555H 115° GROUP (RU)
HCLIDAMIN A.8 NEW MEXICO
PAT SCAT
CONTROL NO. 73-01
DATE 21 AUG 73 - WML 276
FREQUENCY 2200 - WML 0250
POLARIZATION V V BISTATIC 0°
OPERATOR JIS C CDM 06-1
Super Cub
50° Roll, +10° Pitch



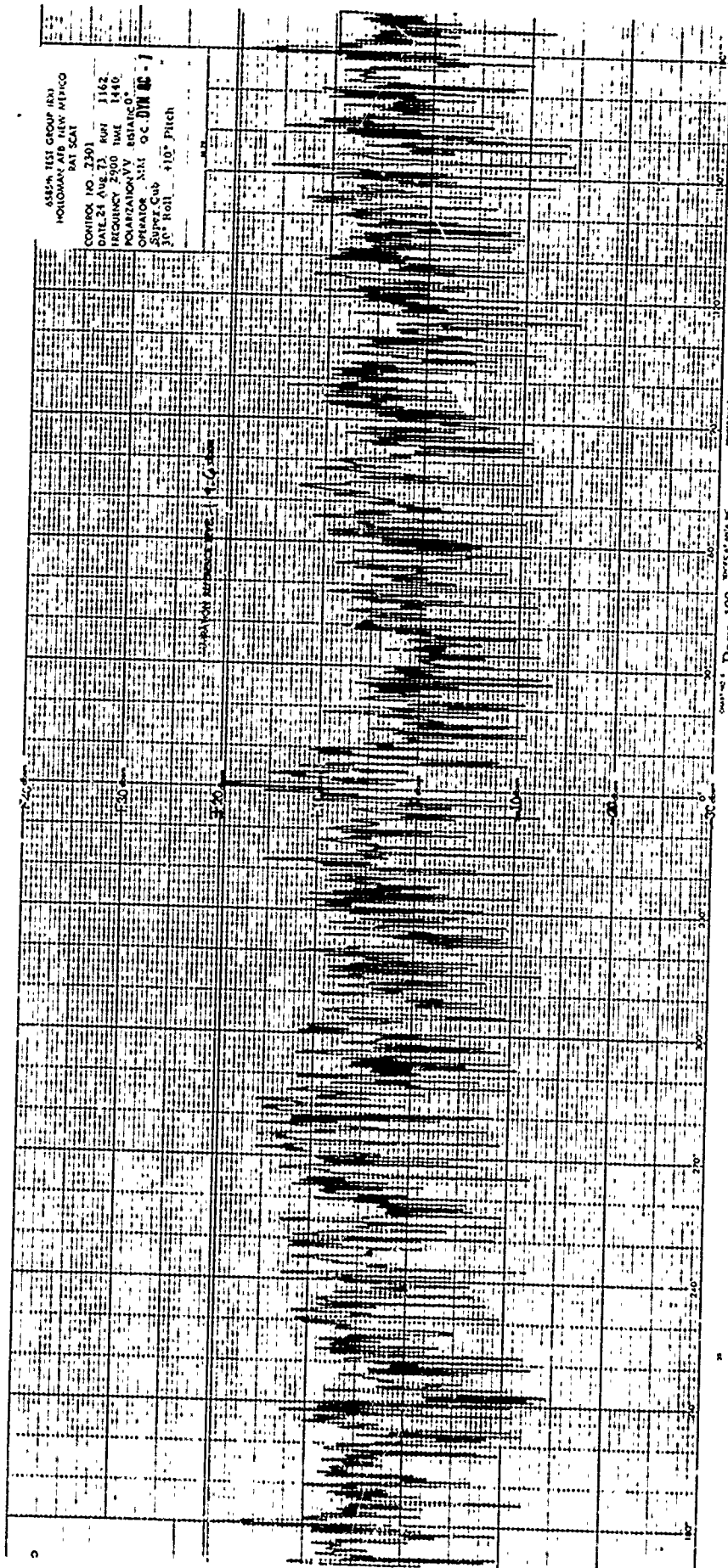


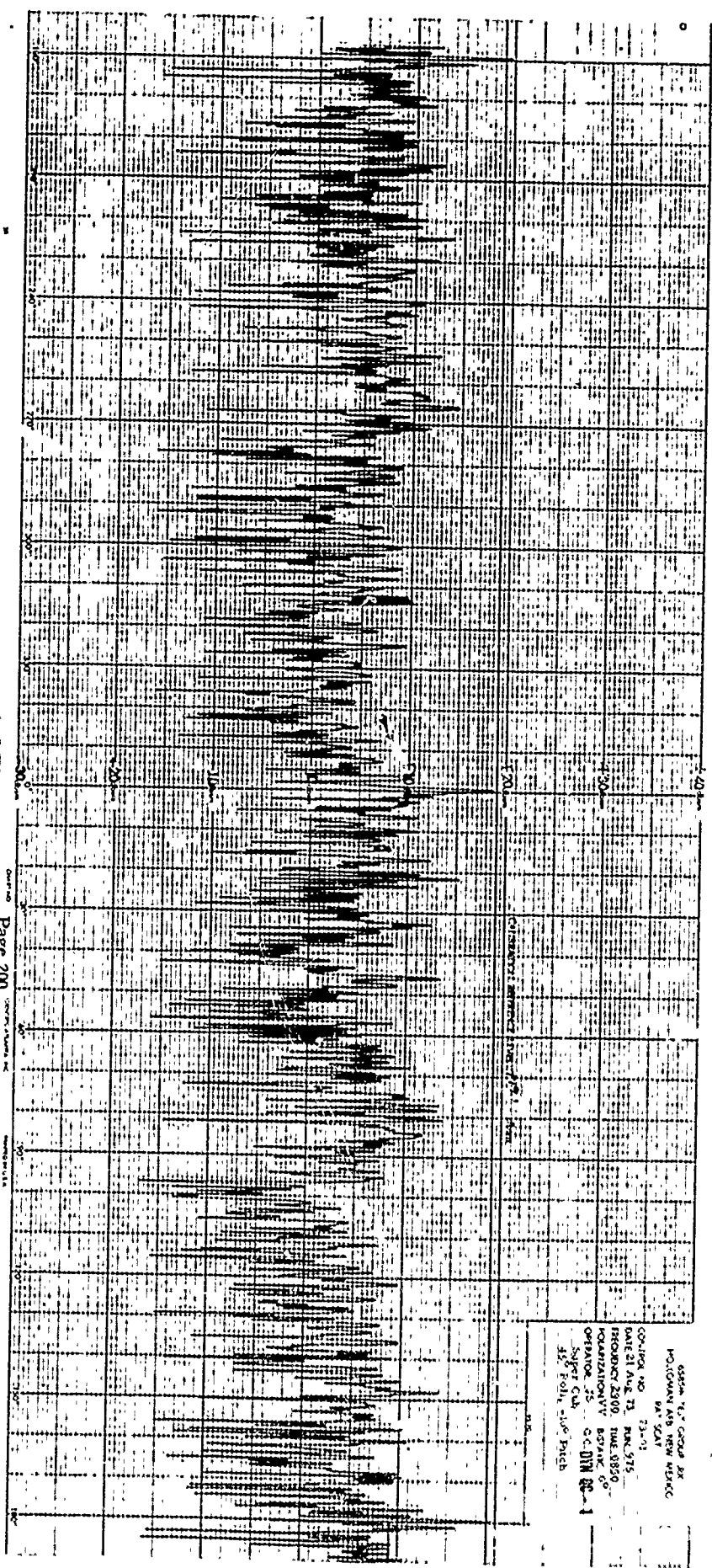
658m 101 GROUP HQ
HOLLOMAN AIR NEW MEXICO
M1 SCN
CONTROL NO. 11-01
DATE 23 AUG 73 AM 1616
FREQUENCY 2700 MHz
POLARIZATION VV ASIANC
OPERATOR JS OC 1111-1
SUPER GRP
107 Roll -5° Dist



65854 1511 GARY JR
 HORTONDAKE NEW MEXICO
 44° 54' N
 107° 15' W
 DATE 23 AUG 73 TIME 1125
 RECORDING 2500' DEPTH
 MOUNTAIN 35° 0' E 15° N
 OF
 CRATER 35° 0' E 15° N
 30° 0' E 15° N
 30° 0' E 15° N

6525% TEST GROUP RAD
 HOLLOWAY AFB NEW MEXICO
 BAT SCAT
 CONTROL NO. 2291
 DATE 24 AUG 73 RUN 1162
 FREQUENCY 2500 TIME 1440
 POLARIZATION VV STATIC 0°
 OPERATOR NMI OC JVN 40-1
 SUPER Cub
 30° Roll +10° Pitch





6555m 14.7 CORDS BX
 HOLCOMB AFB NEW MEXICO
 14.7 SCAT
 CON-104 NO 73-01
 DATE 21 AUG 73 REC 375
 FREQUENCY 2300 TIME 0850
 ORGANIZATION BVNAIC CO
 OPERATOR JS CC DTM SC-1
 SUPER CUB
 310 Pch, -100 Pch

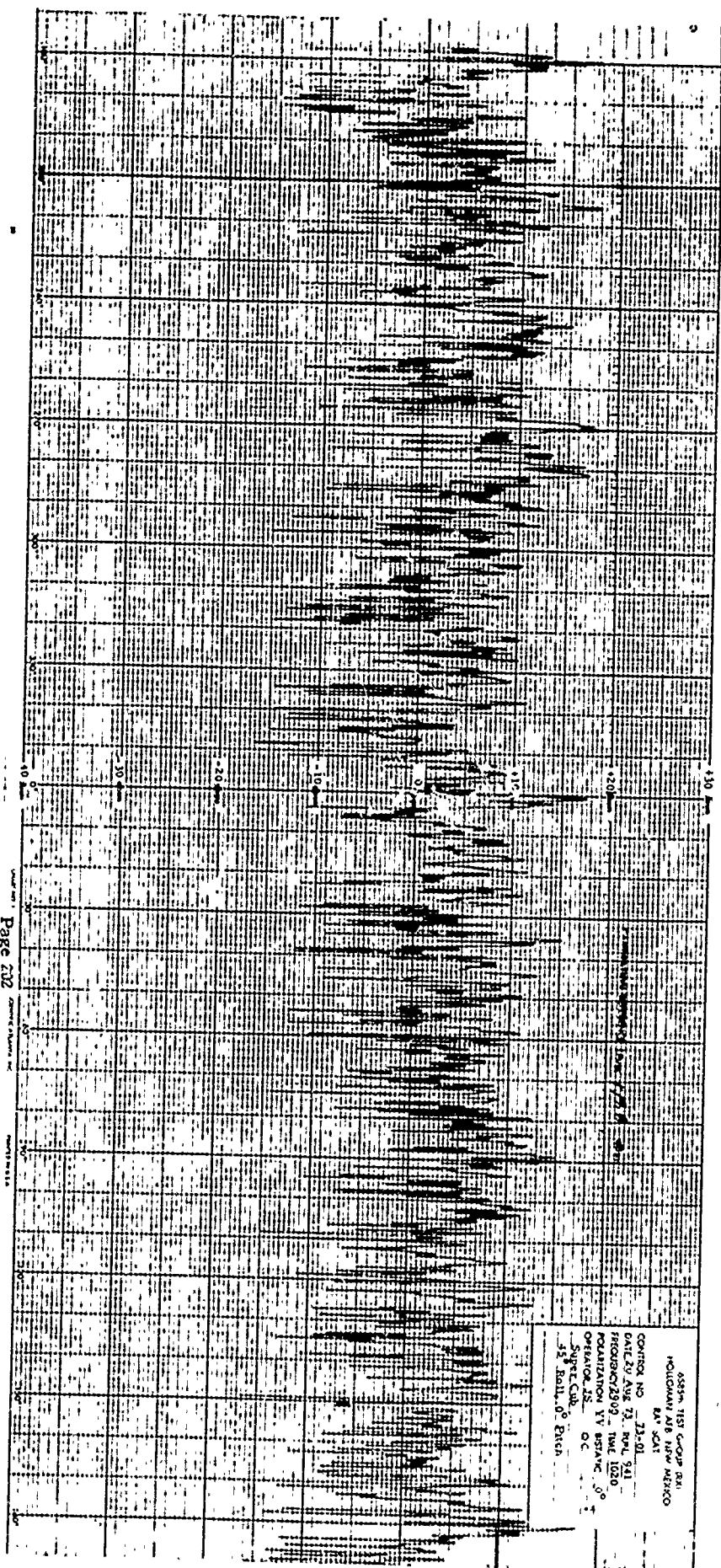
22277

65141 TEST GROUP 561
HOLCOMB, BAT SCAT
OPERATOR IN Q C DYN UC - 1
Super Cub 44 Pitch
150 Roll

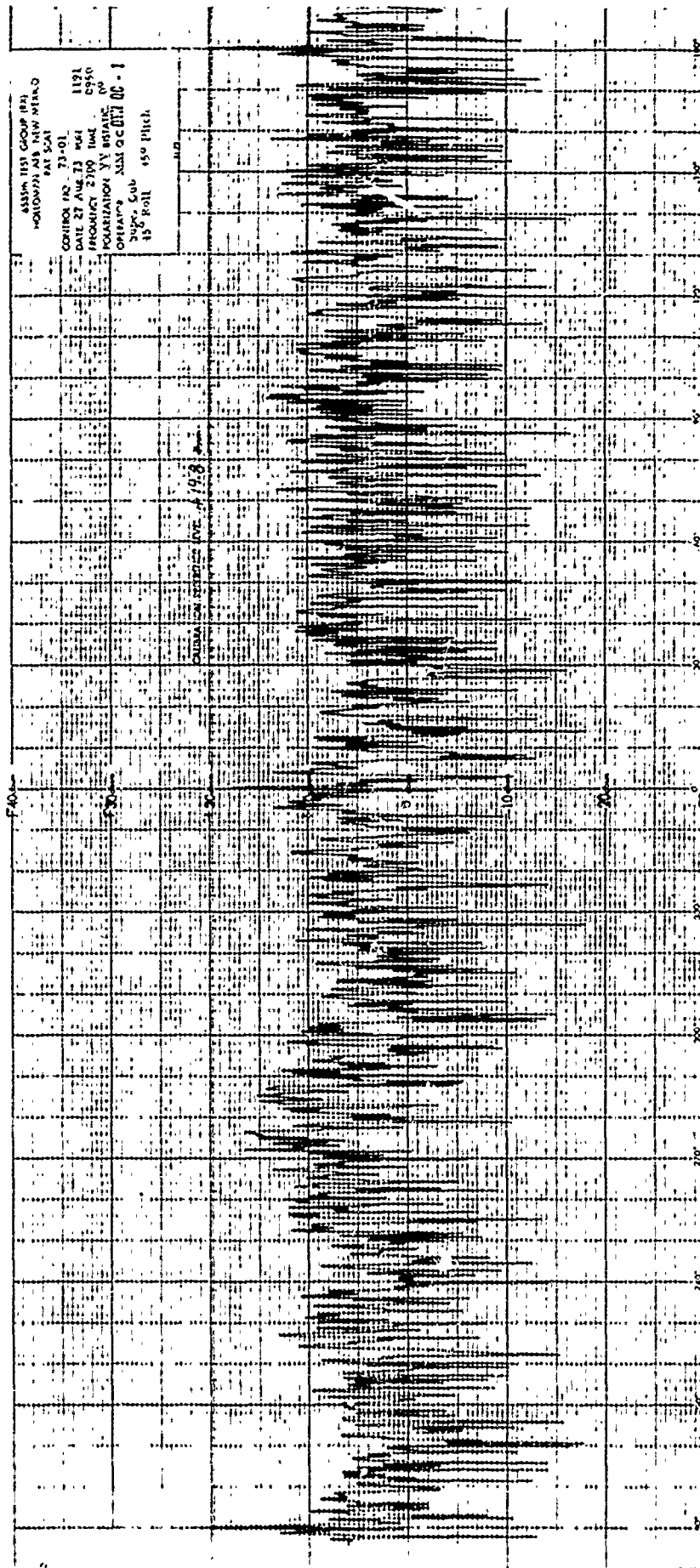
DATE 30 AUG 71
FREQUENCY 2500
MODULATION VV 45 Hz
1120

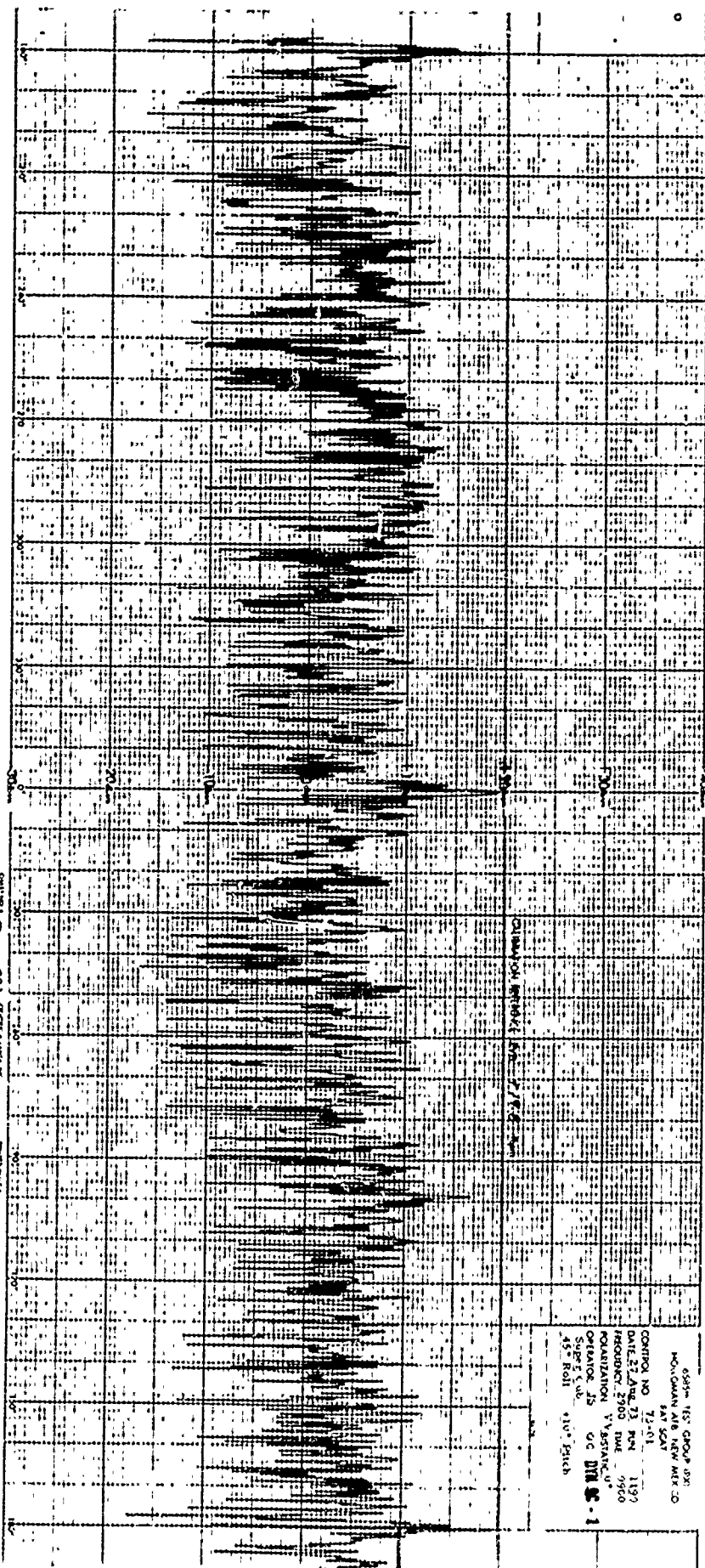
1000
900
800
700
600
500
400
300
200
100
0

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850 860 870 880 890 900 910 920 930 940 950 960 970 980 990 1000

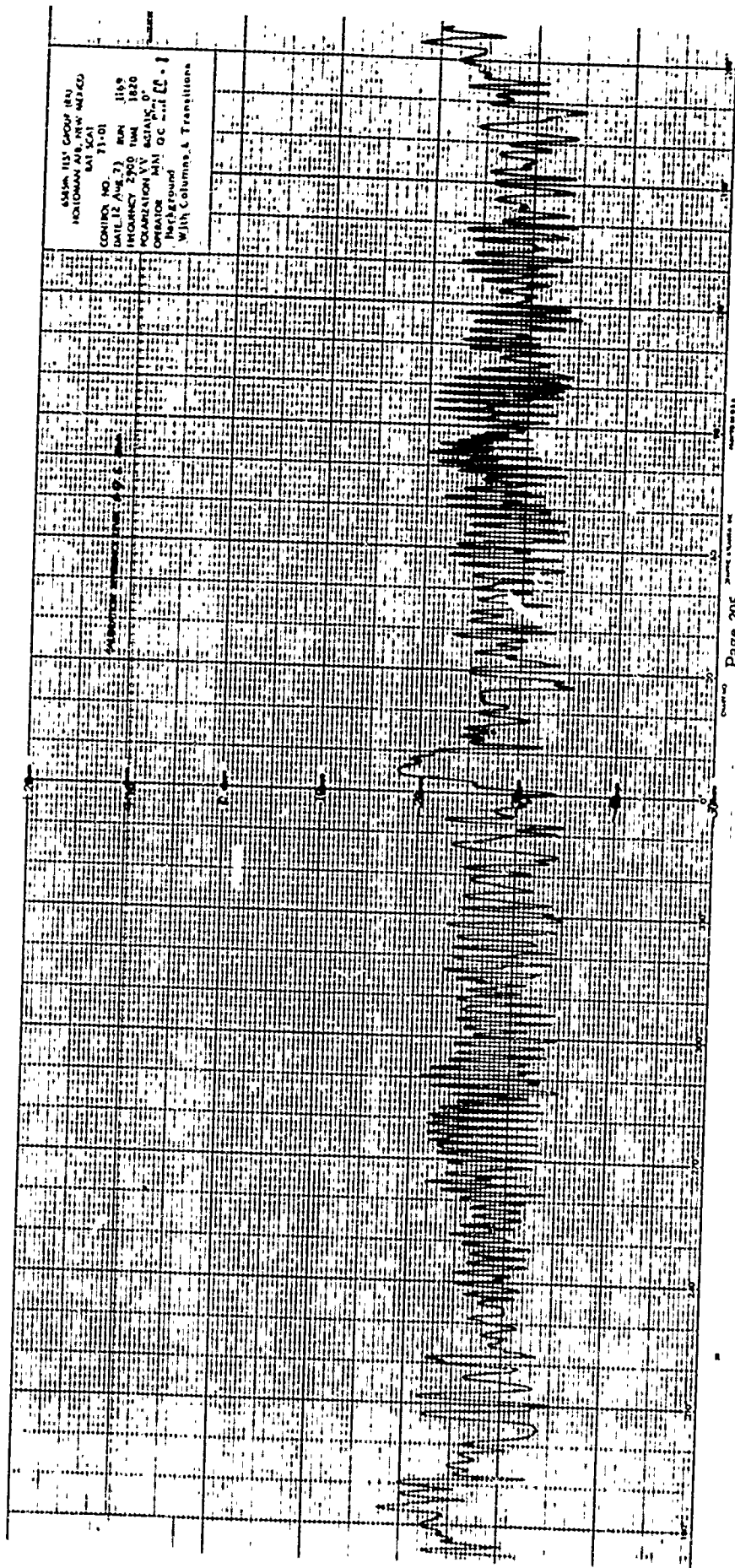


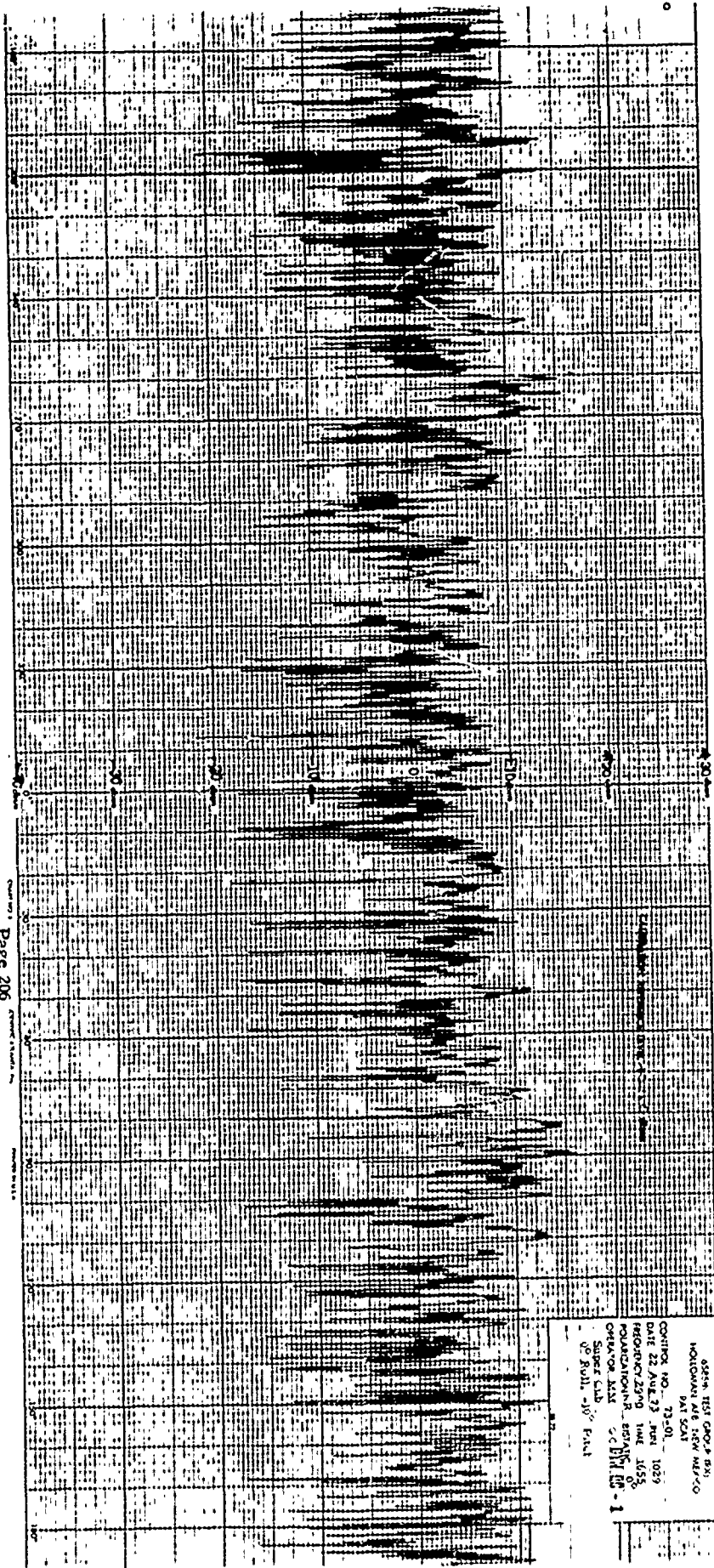
6553- 1151 GROUP B31
 HOLLAND AFB NEW MEXICO
 BAY SCAT
 CONTROL NO 13-01
 DATE 20 Aug 73, RUN 941
 FREQUENCY 2902 - TIME 1020
 POLARIZATION TV STATION 0°
 ORBITAL JS OC
 SuperCub
 35° Roll, 0° Pitch

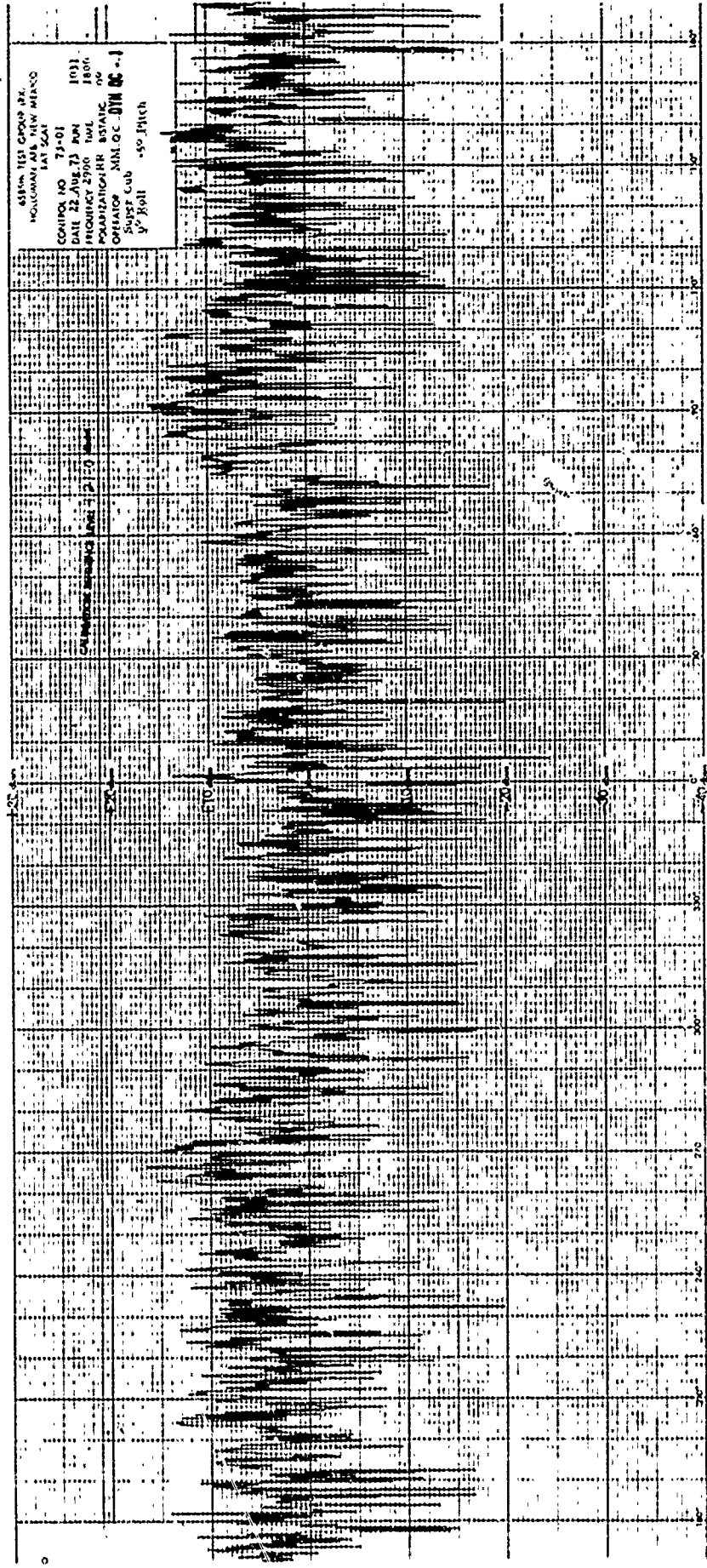


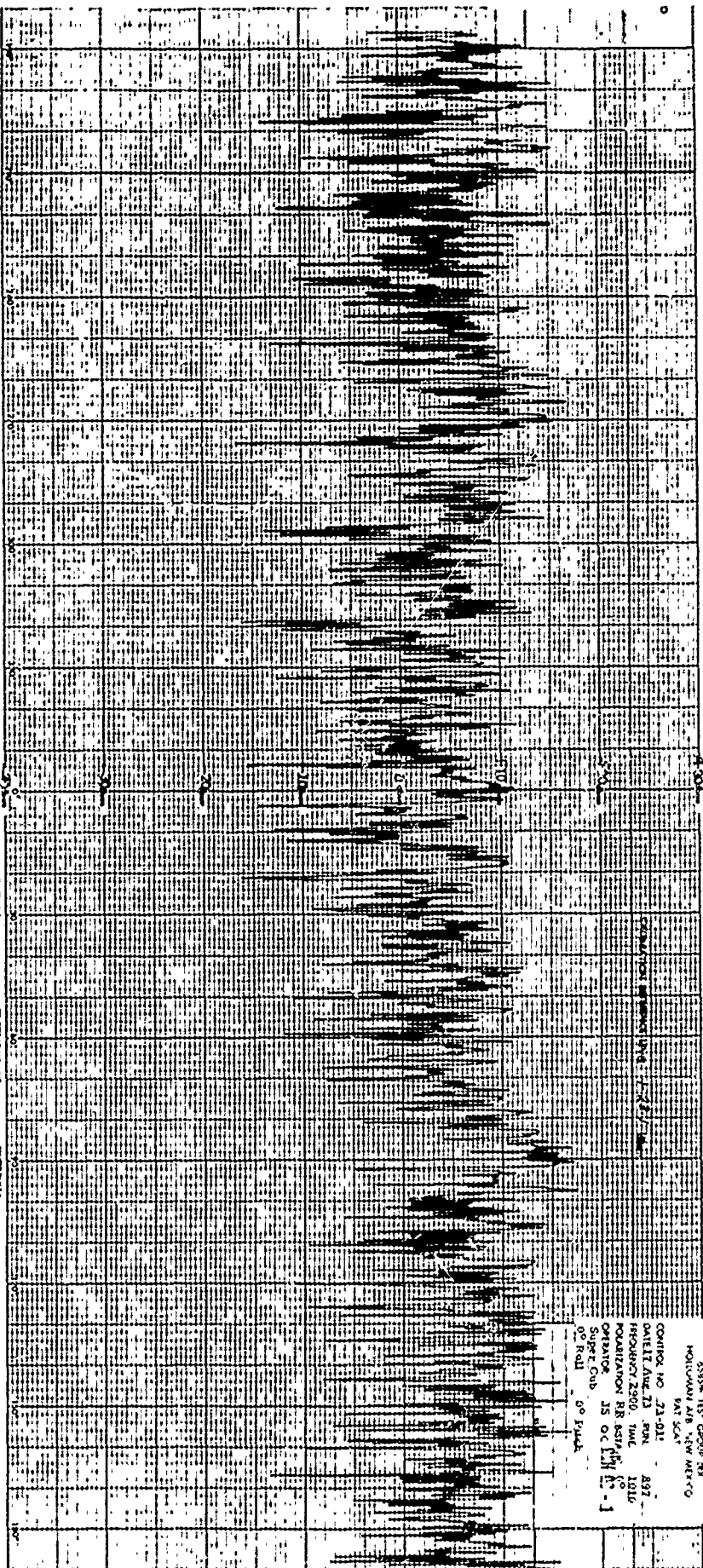


6595-157 GROUP 021
HOLCOMAN AFB NEW MEXICO
FAT SCAT
CONTROL NO 73-01
DATE 21 AUG 73 RW 1197
FREQUENCY 2900 MHz 7950
POLARIZATION VERTICAL
OPERATOR JS CC DIM 6-1
Sup 5.00
45° Roll
+10° Pitch







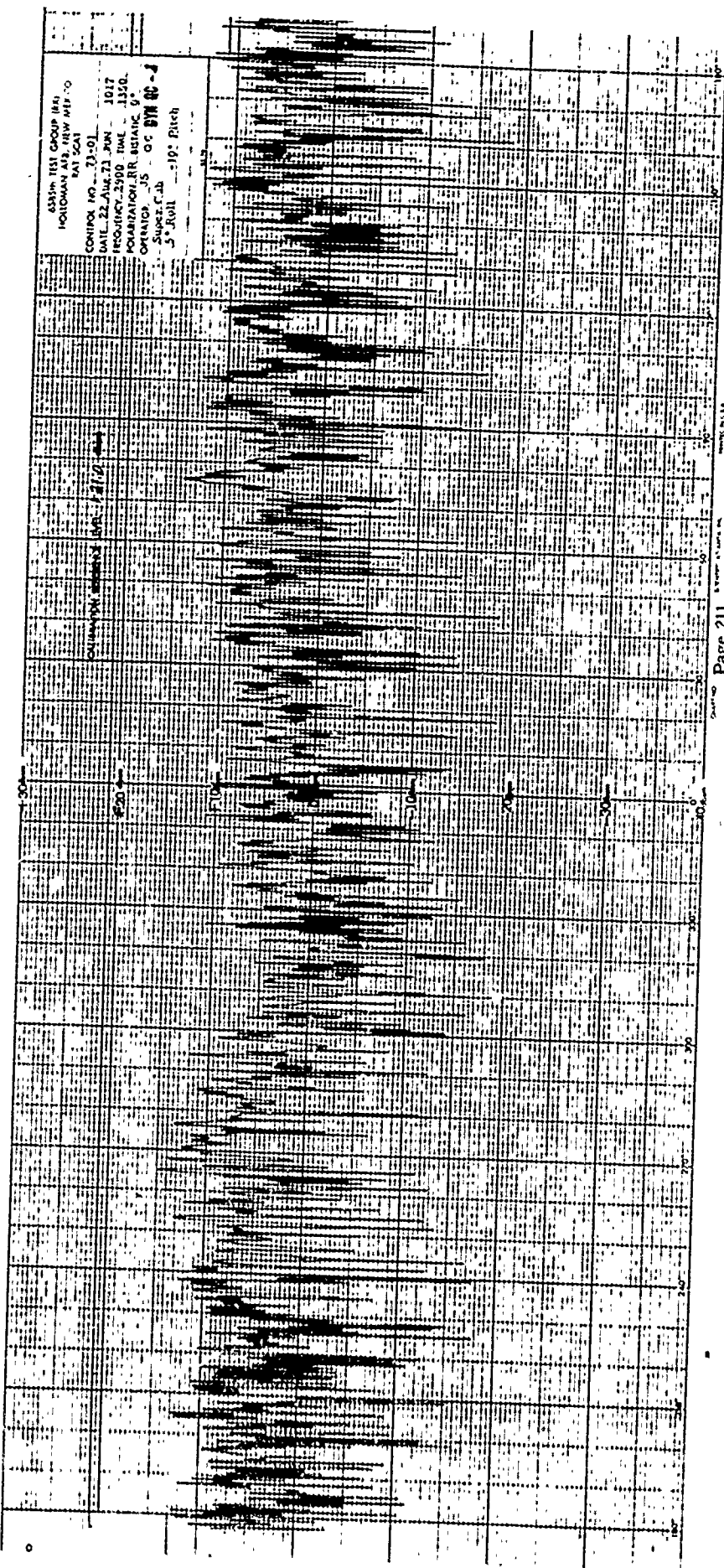


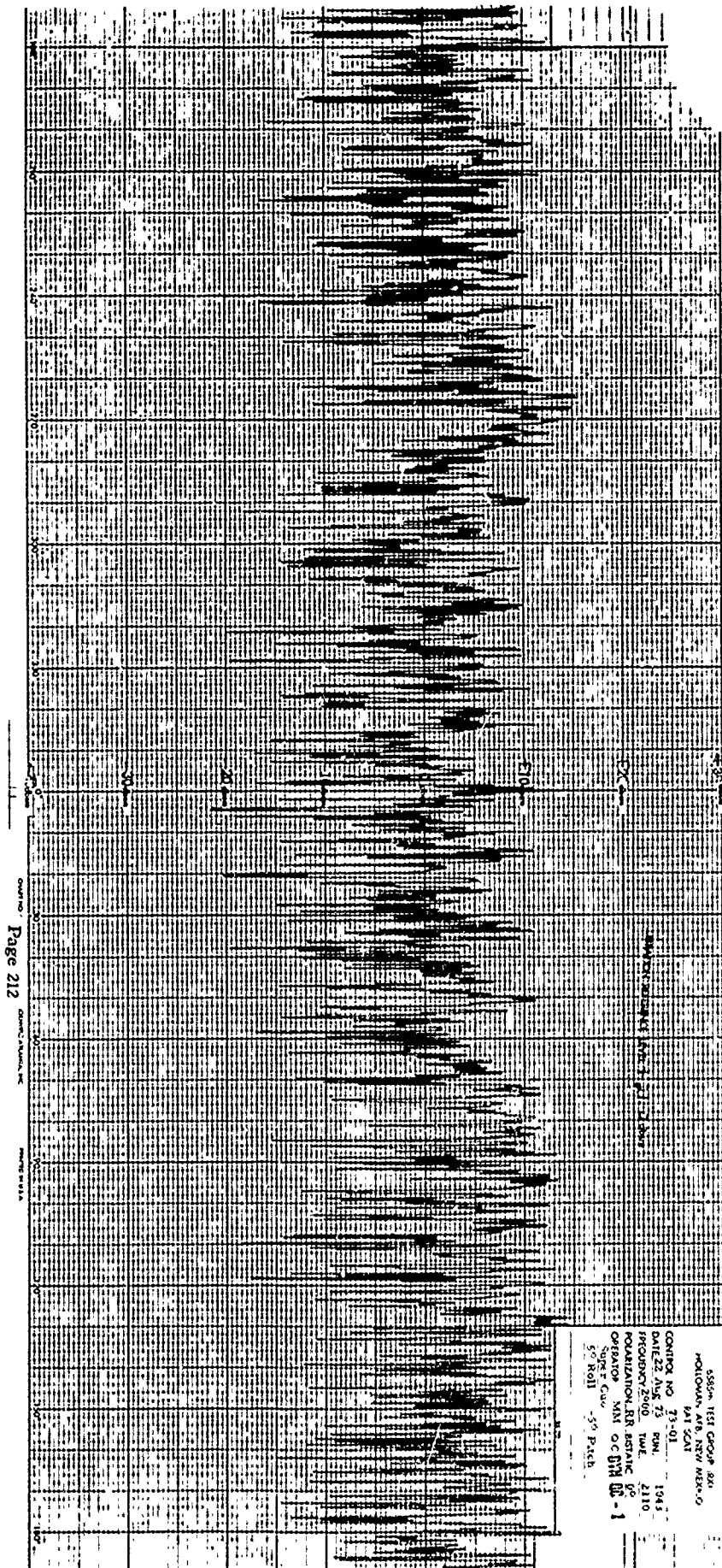
4554- 1ST GROUP BY
 HOLLOMAN AFB NEW MEXICO
 1ST SGT
 CONTROL NO 21-011 897
 DATE 11 AUG 73 1000
 FREQUENCY 2300 TMC
 POSITION 10 4510
 OPERATOR 15 00 1111
 Super Cub 60 Push
 60 Roll

[illegible]

635TH TEST GROUP BRN
HOLLOMAN AIR, NEW MEXICO
BAT SCAT
CONTROL NO. 73-01
DATE 22 AUG 73 RUN 1017
FREQUENCY 2500 KHz 1150
POLARIZATION R.R. STATIC 9°
OPERATOR JS OC 87M 80-3
Super Cab
3° Roll -19° Pitch

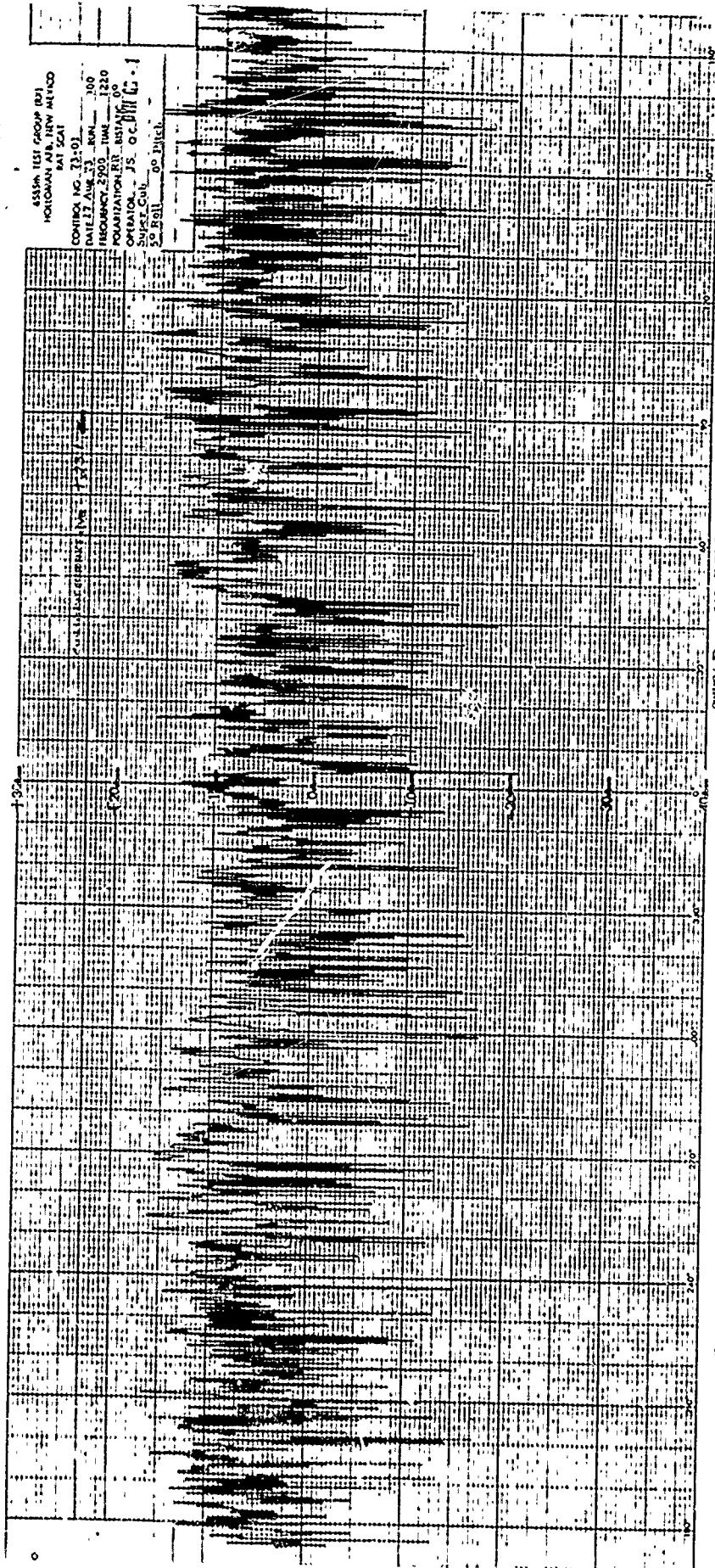
QUANTUM CORRELATION NO. 2772

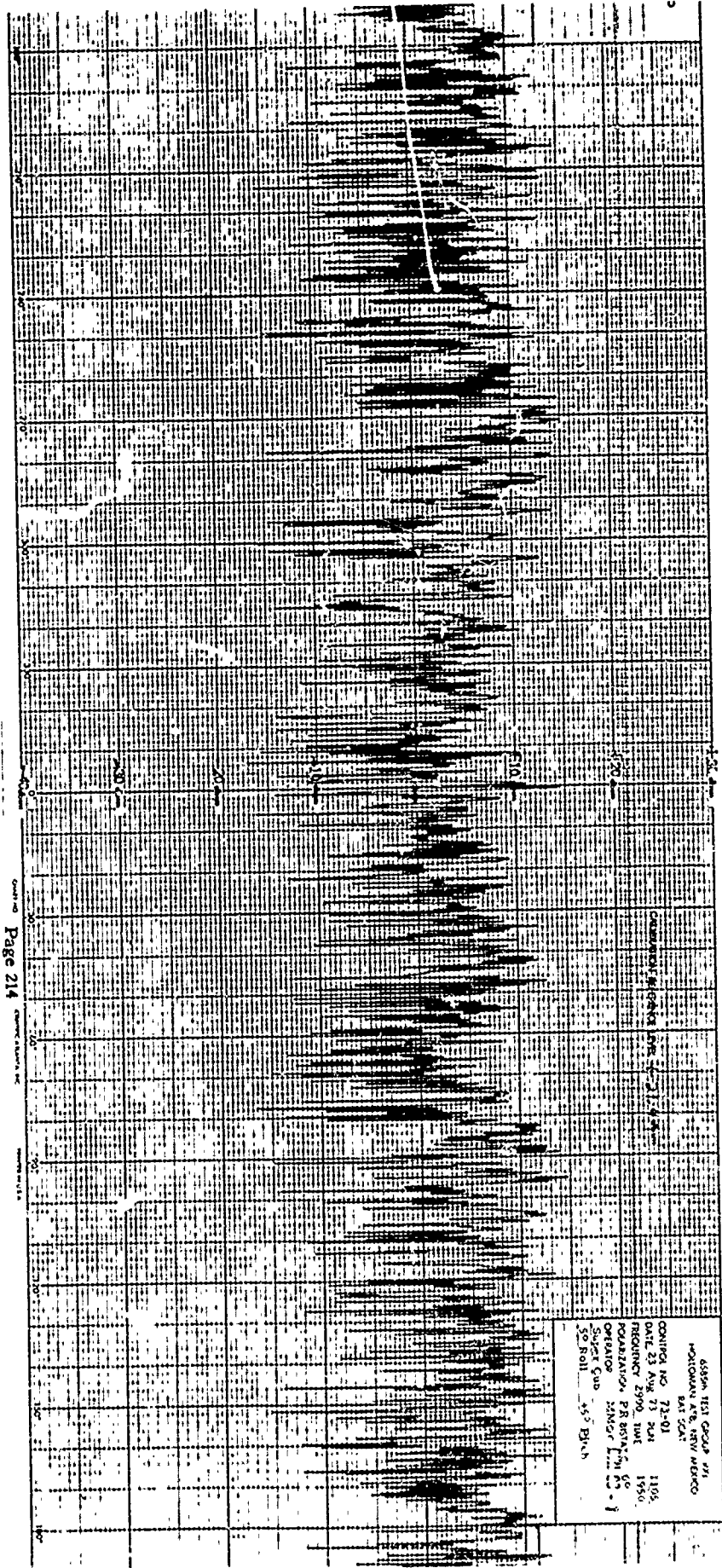




455th TEST GROUP (B)
HOLCOMB AFB, NEW MEXICO
BAT SCAT

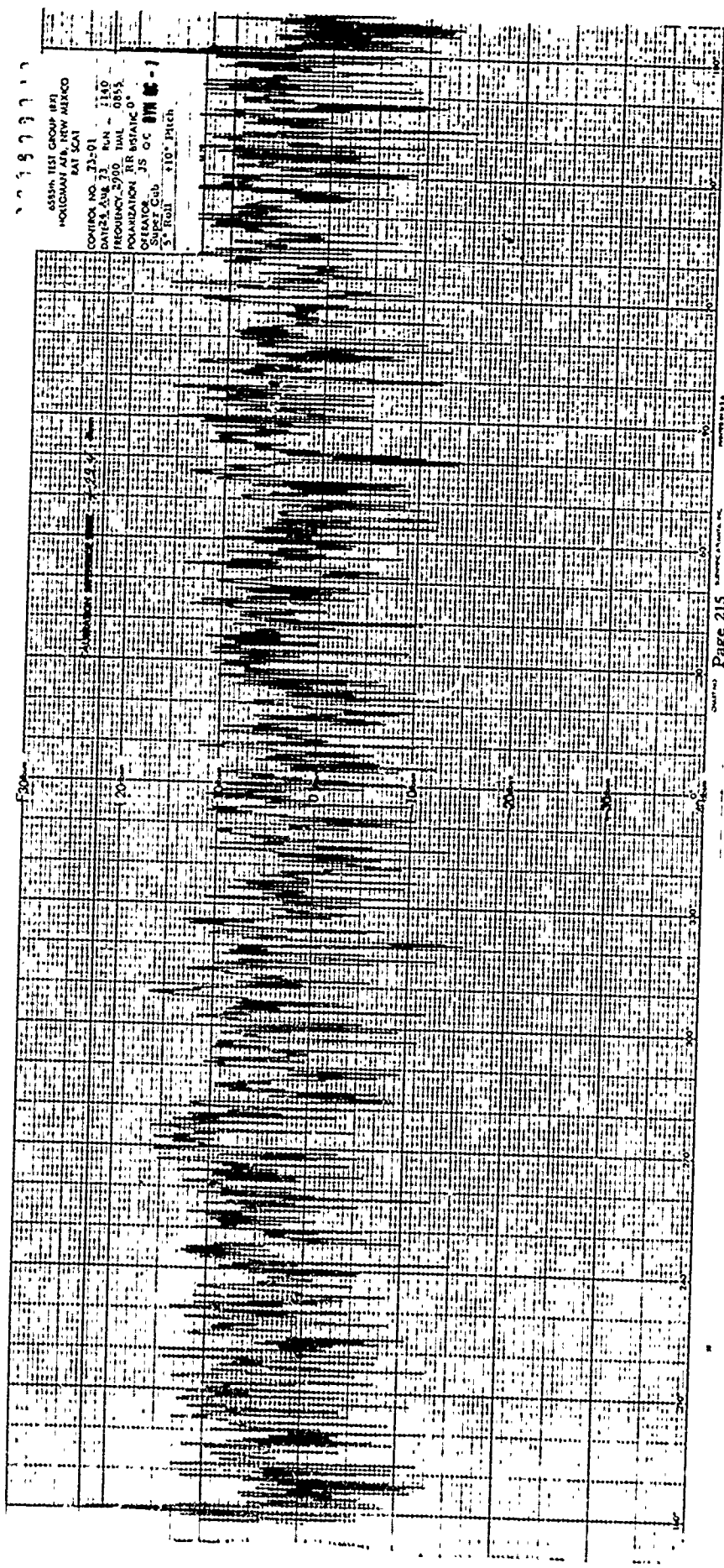
CONTROL NO. 73-01
DATE 17 AUG 73 RUN 300
FREQUENCY 2500 TIME 1220
POLARIZATION R.R. INSTANT 00
OPERATOR J.S. O.C. DTG 6-1
Superf. Curb
50 Roll 00 Pitch

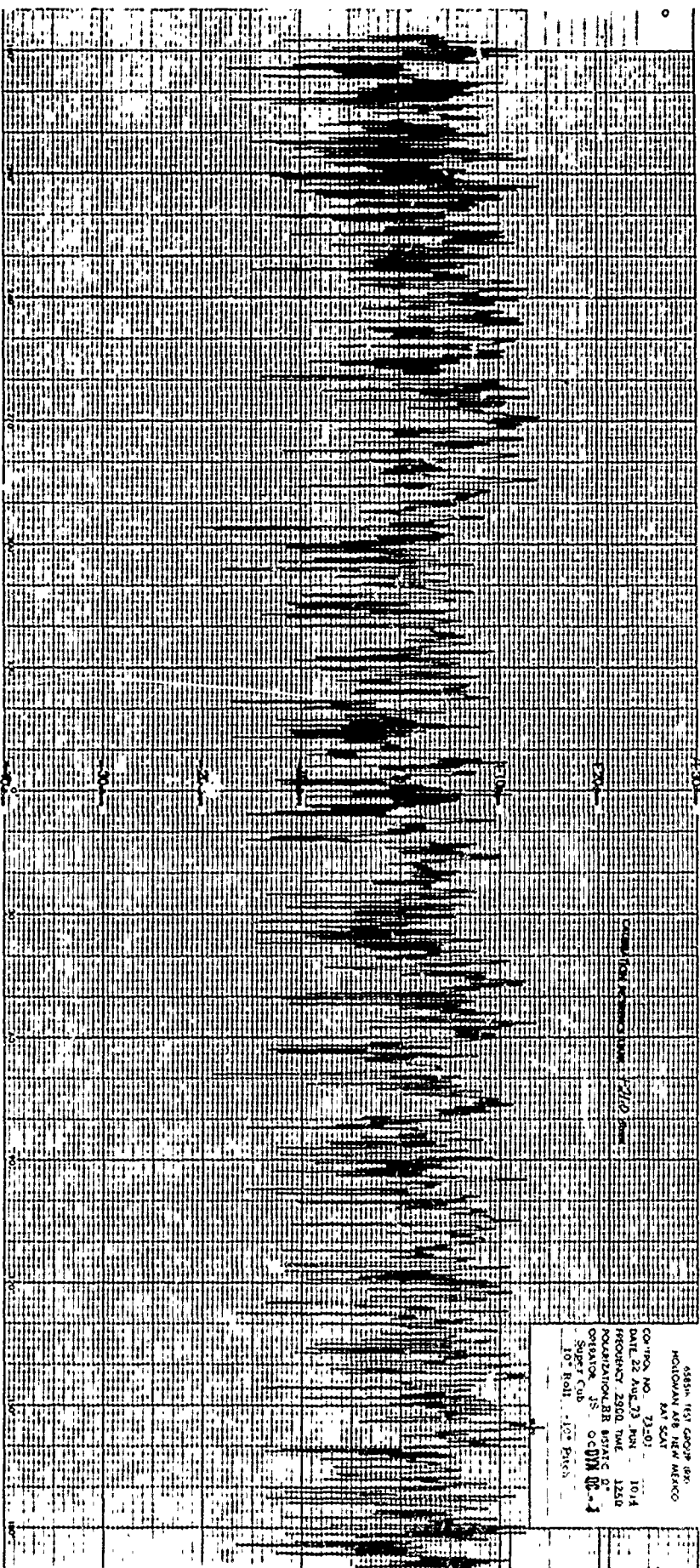




Count No Page 214

6550H TEST GROUP 771
 HOLLAND AFB, TEXAS
 BAI 501
 CONTROL NO 72-01
 DATE 23 Aug 73 241 1105
 FREQUENCY 2990. 101 1950
 POLARIZATION PR 854.5 50
 OPERATOR JANCOR Lm 23 - 1
 Subject Cup
 50 Roll 45° Pitch



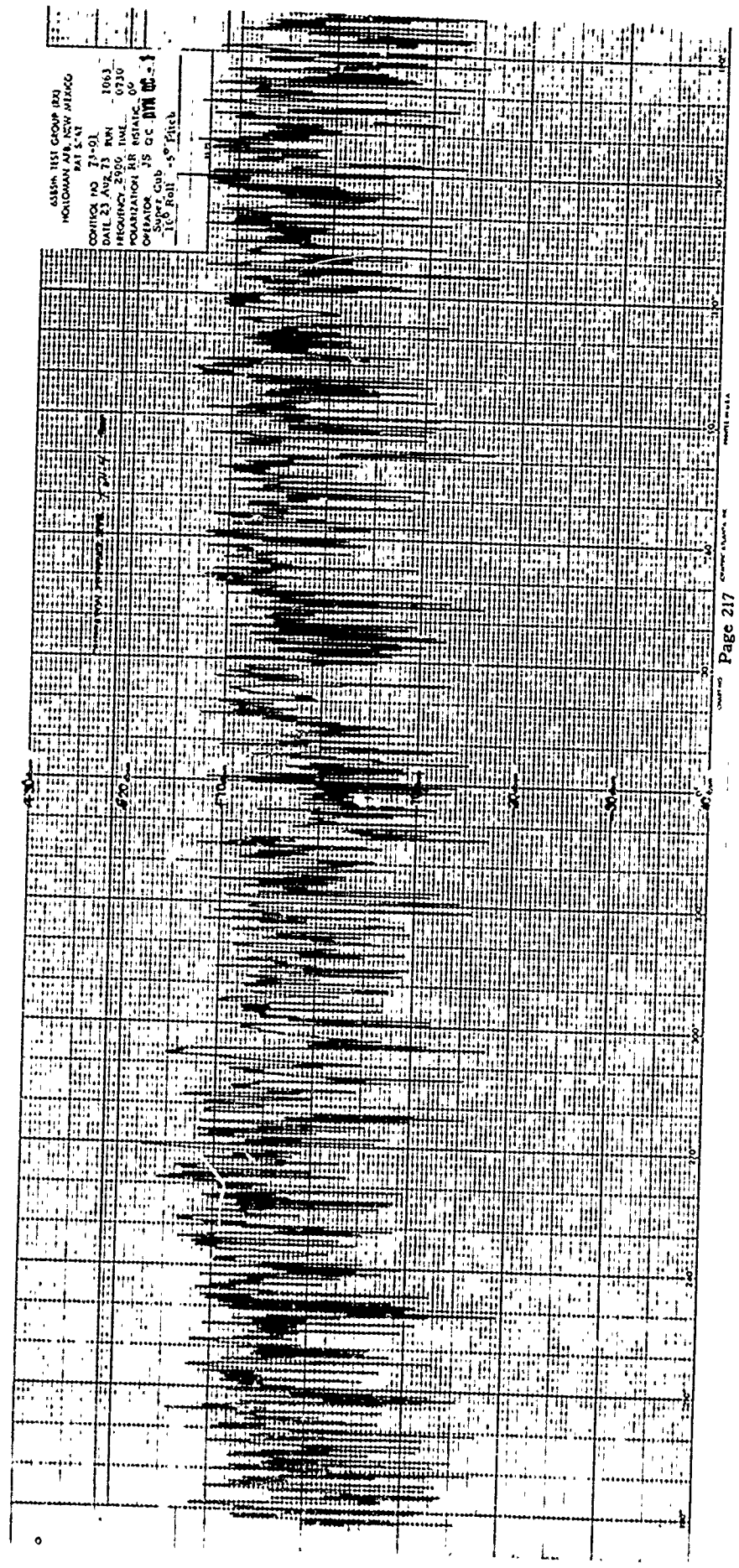


ASSN. 101 GQ2P BX
HOLCOMB AT SCOT
COMP. NO. 7520
DATE ACQ'D 10/14
FREQUENCY 2500 KHz
RECORDING 151515
SERIAL NO. 0001
101 Roll - 102 Pitch

6354A TEST GROUP (B3)
HOLDMAN AIR, NEW MEXICO

DATE 23 AUG 73 RUN 1063
FREQUENCY 5.950 MHz
POLARIZATION RH POLAR
OPERATOR GUB JS CC DM CC

10.6 Roll -5° Pitch



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WILLIAM H. HARRIS

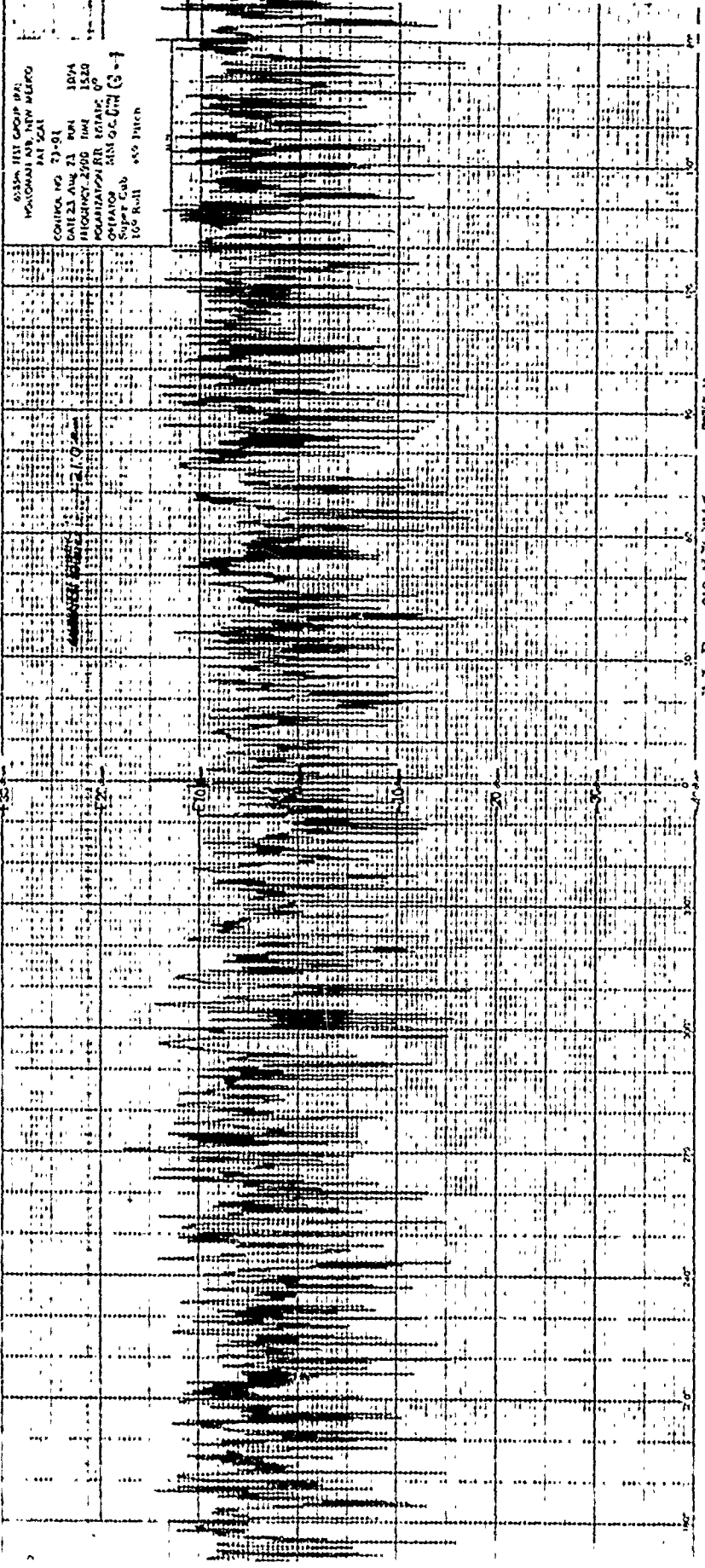
Figure 1

1984

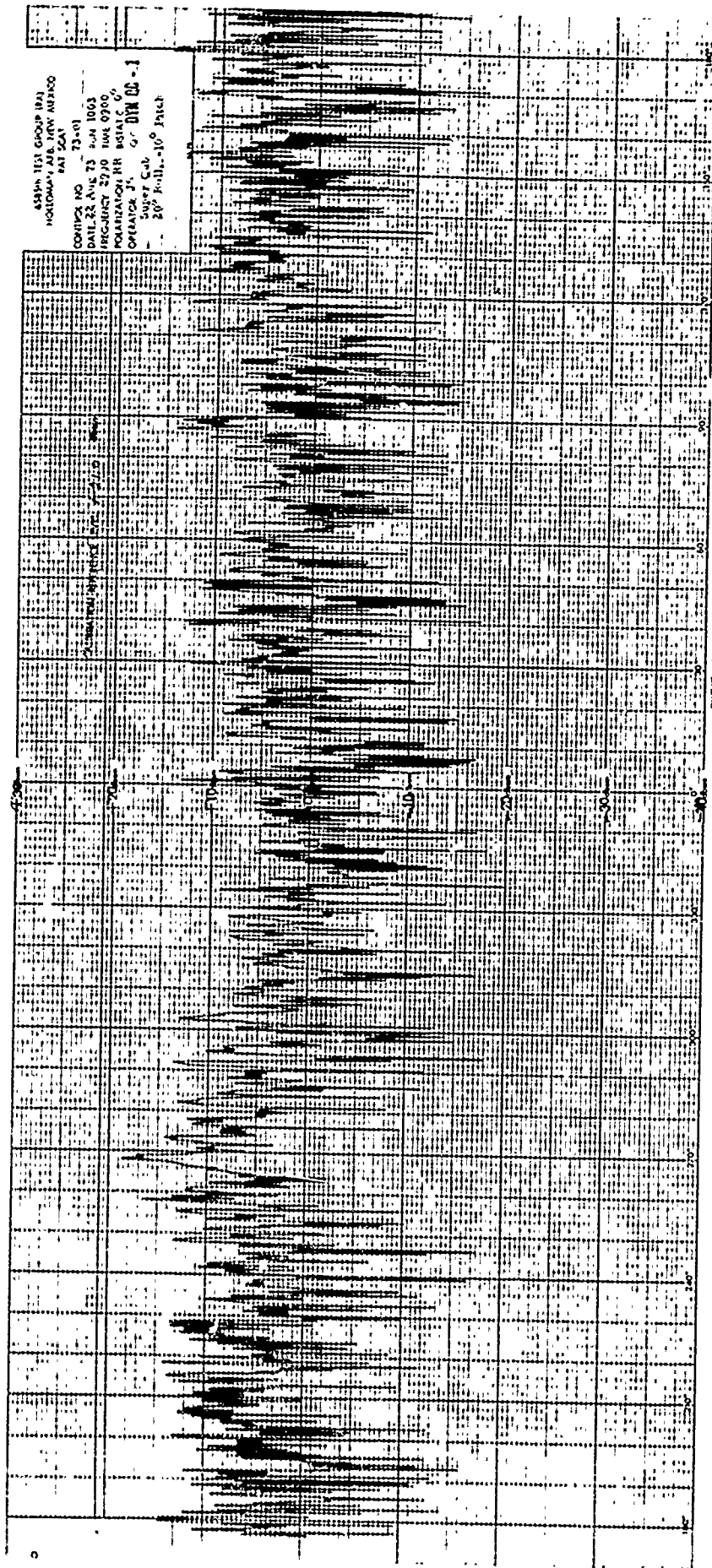
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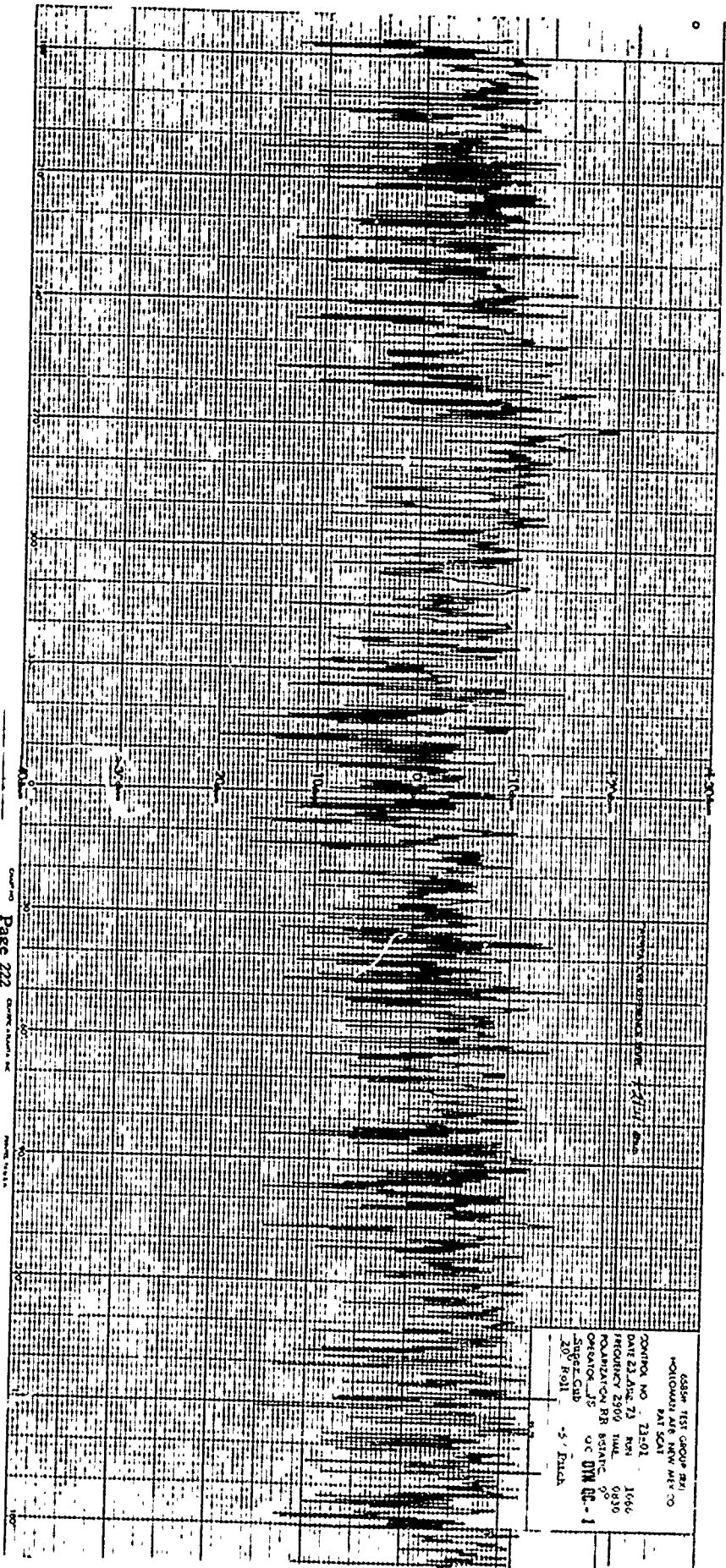
100-443886-1

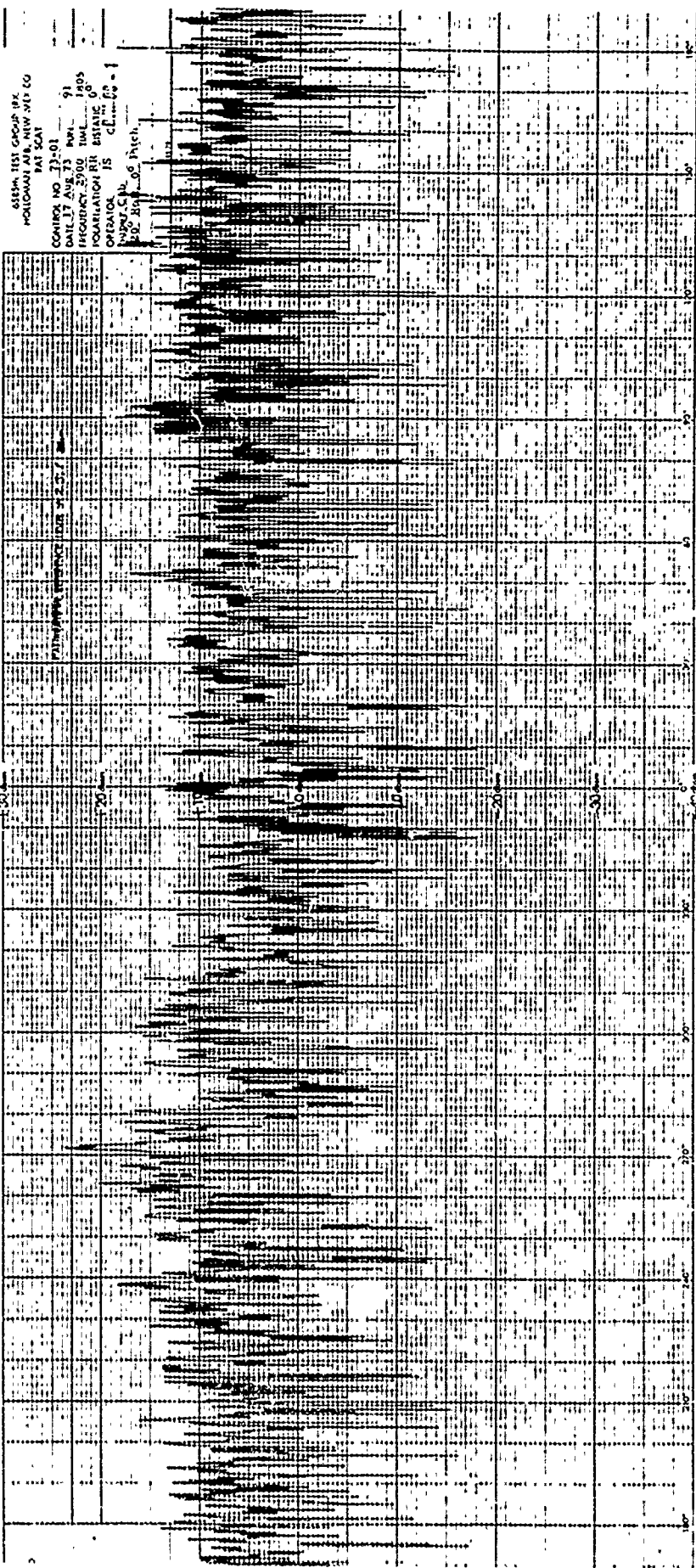
0334-111 GROUP 171
WALTONMAN AIR NEW MEXICO
AT 221
CONTINGENT 23-01
DATE 21 AUG 71 1004
FREQUENCY 2900 HZ
POLARIZATION RTR INITIAL 0°
ORIENTATION MIN 0.000
TYPE CUB 440 PITCH
10° Roll

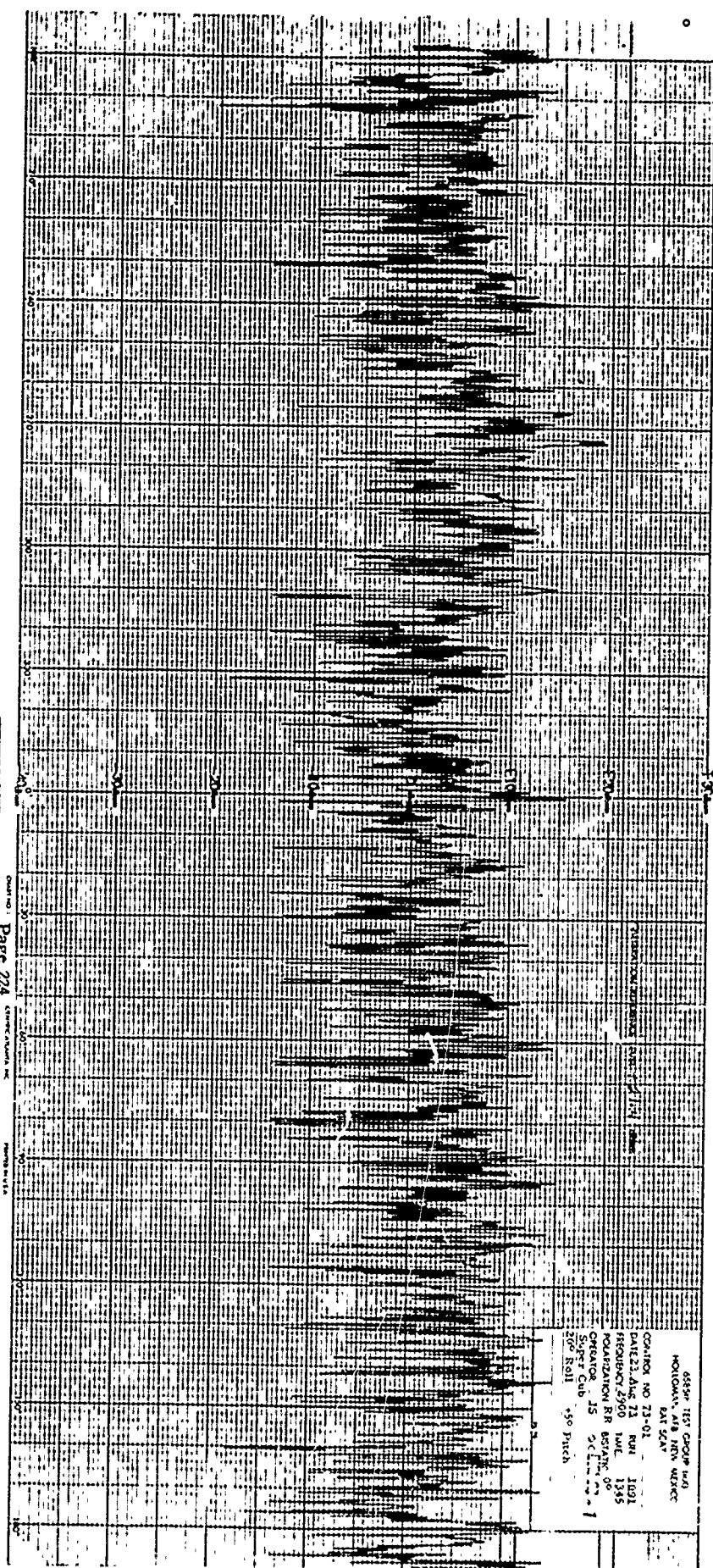


ASPH TEST GROUP 1821
HOLLOMAN, AFB, NEW MEXICO
PAT 5041
CONTINUED NO. 73-01
DATE 22 AUG 73 RUN 1003
FREQUENCY 27.00 MHz 0900
POLARIZATION HR 0900
OPERATOR JN 07 DM CC-1
Super Cal
20° Roll, 10° Pitch



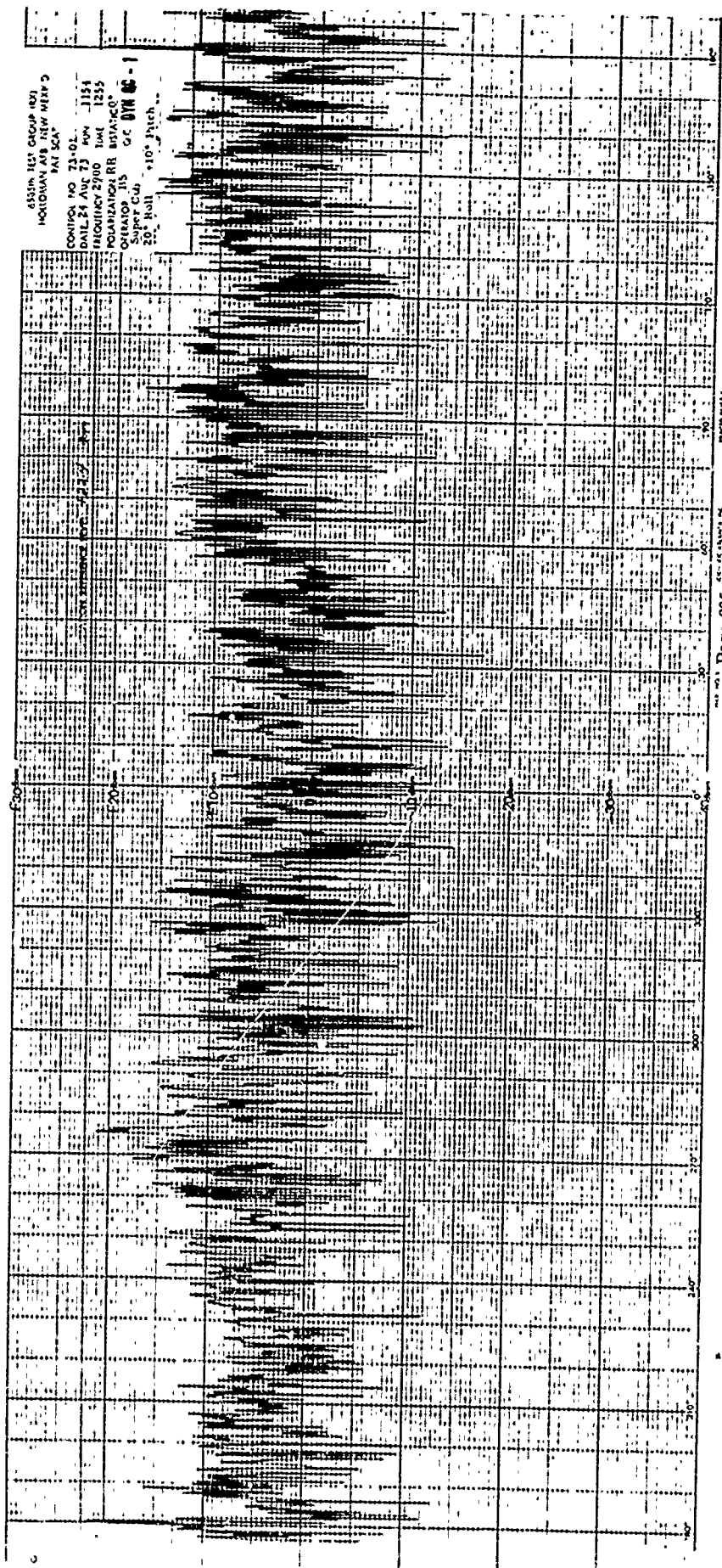


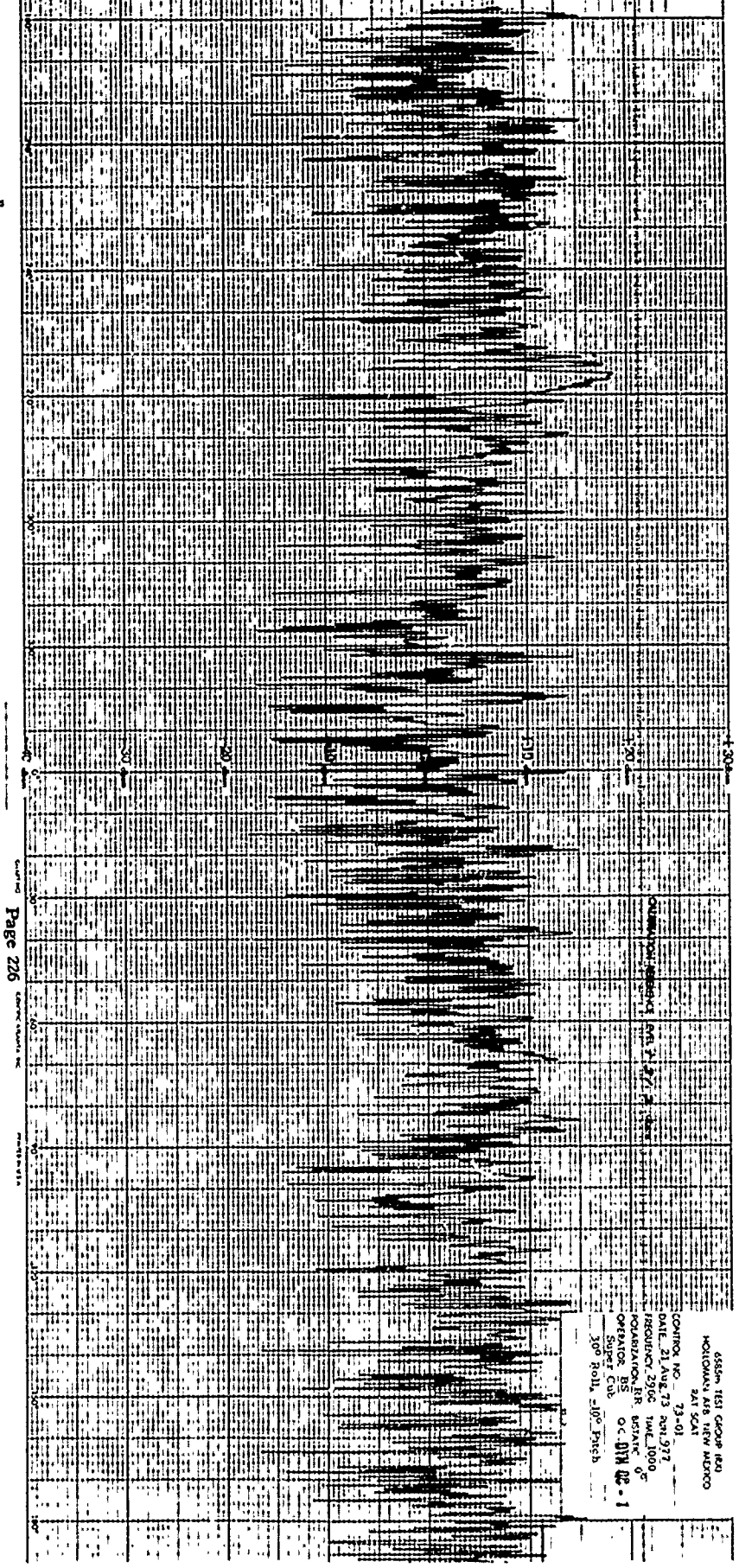




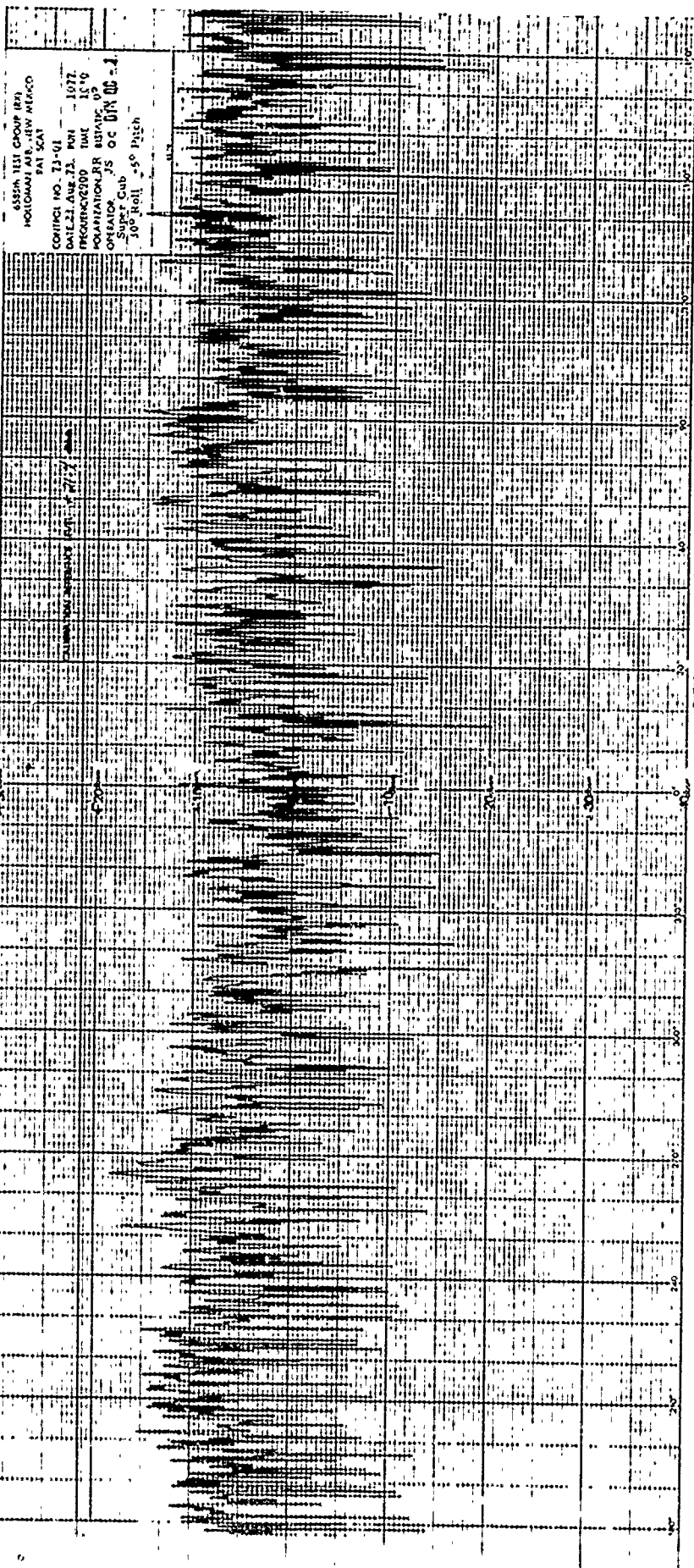
4025 274
CAXIN M31 81V NAVY/10104
EXR 47002 1531 445059

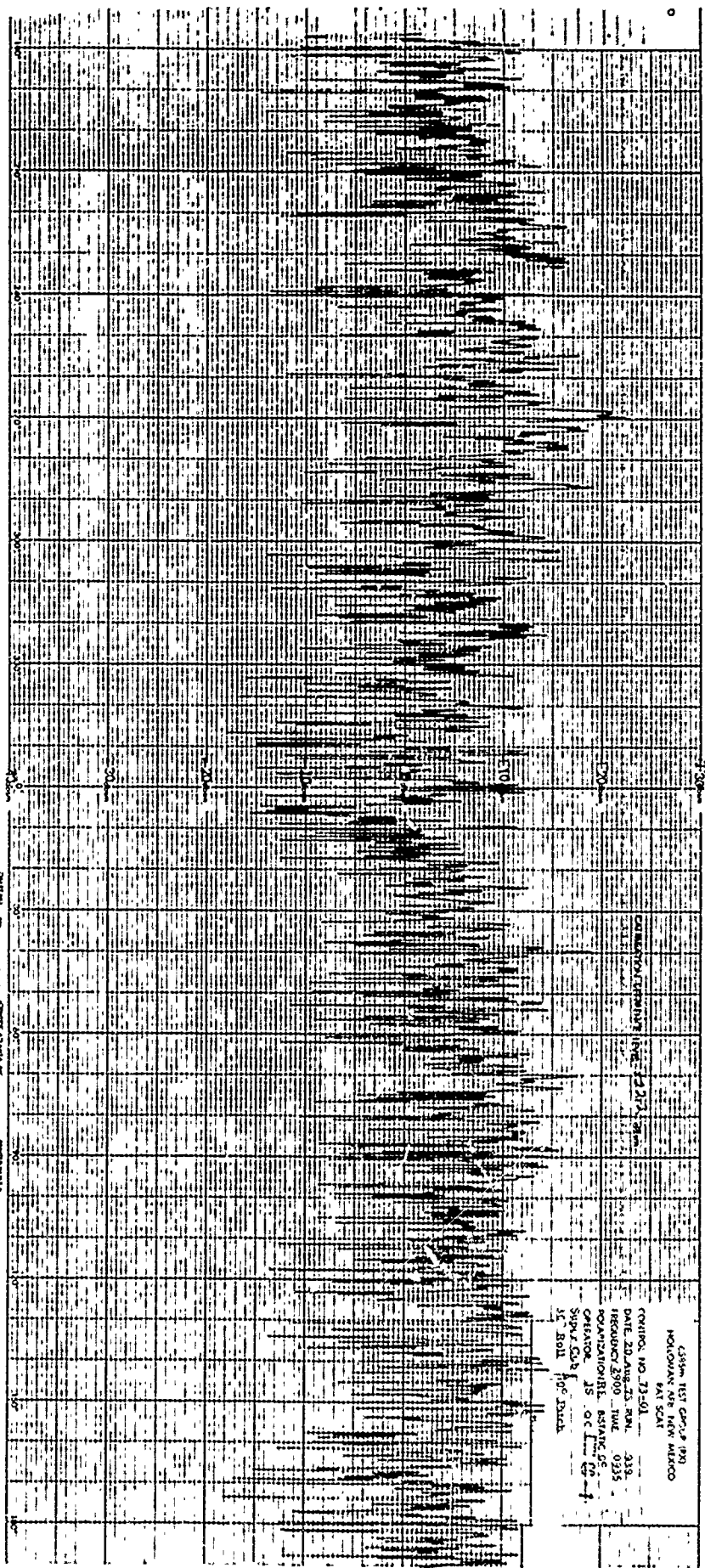
CONTROL NO 73-02-
DATE 24 AUG 73
FREQUENCY 2900 MHz
POLARIZATION RH
Super CW
20° Roll
+10° Pitch



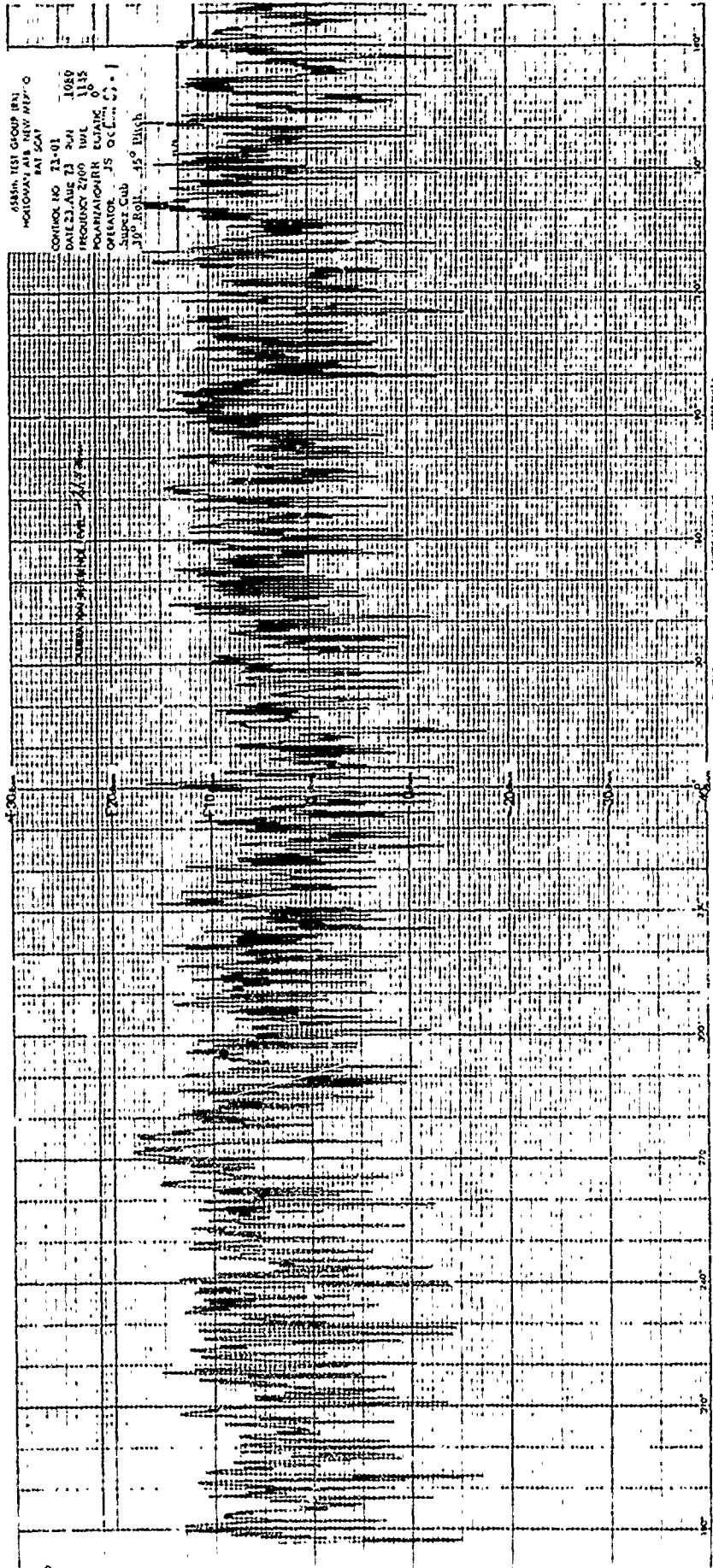


455m TEST GROUP 180
HOLLOMAN AIR NEW MEXICO
241 SCAT
CONTROL NO. 73-01
DATE 21 Aug 73 PM 1977
INSURANCE 296C TIME 1000
OPERATOR BR OC DM 02-1
Super Cub
300 Roll, 100 Pitch

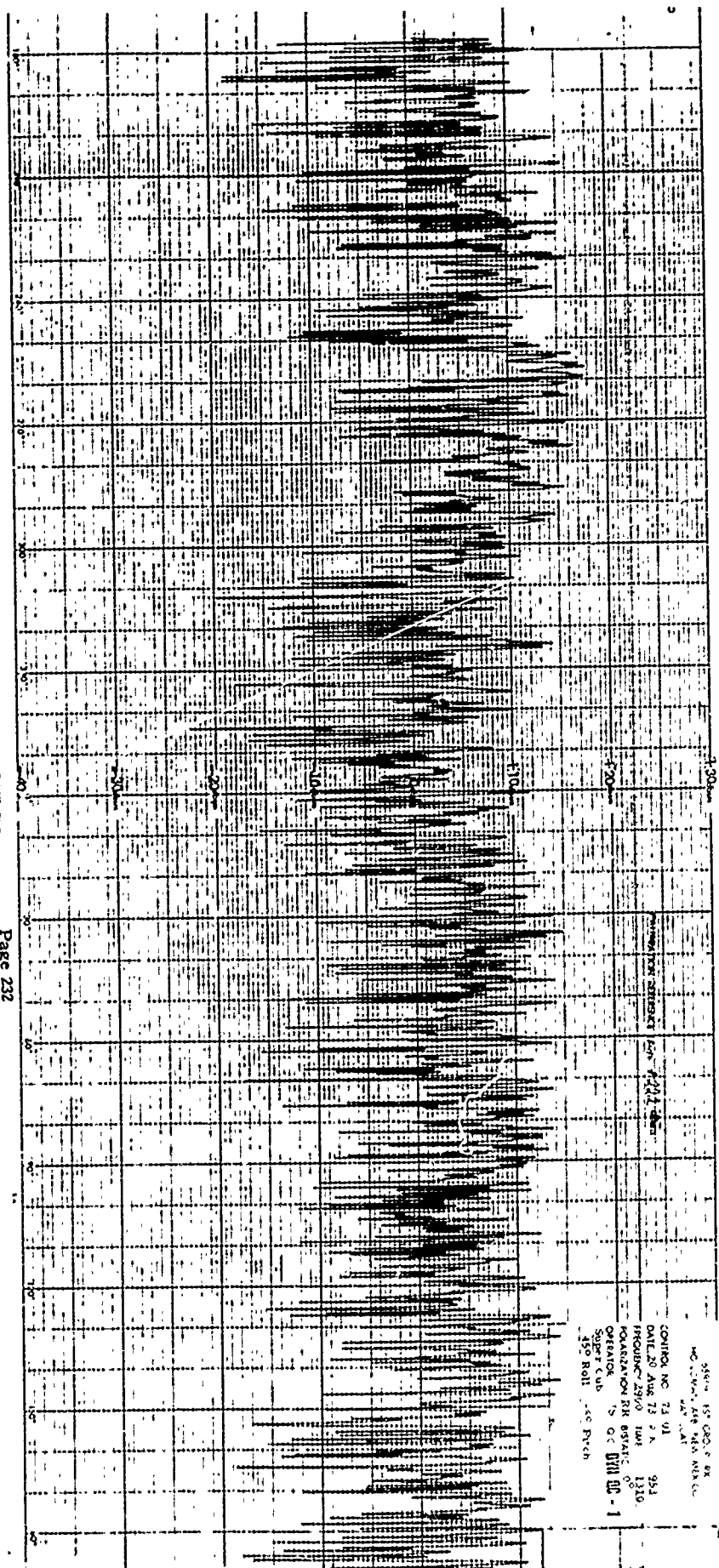




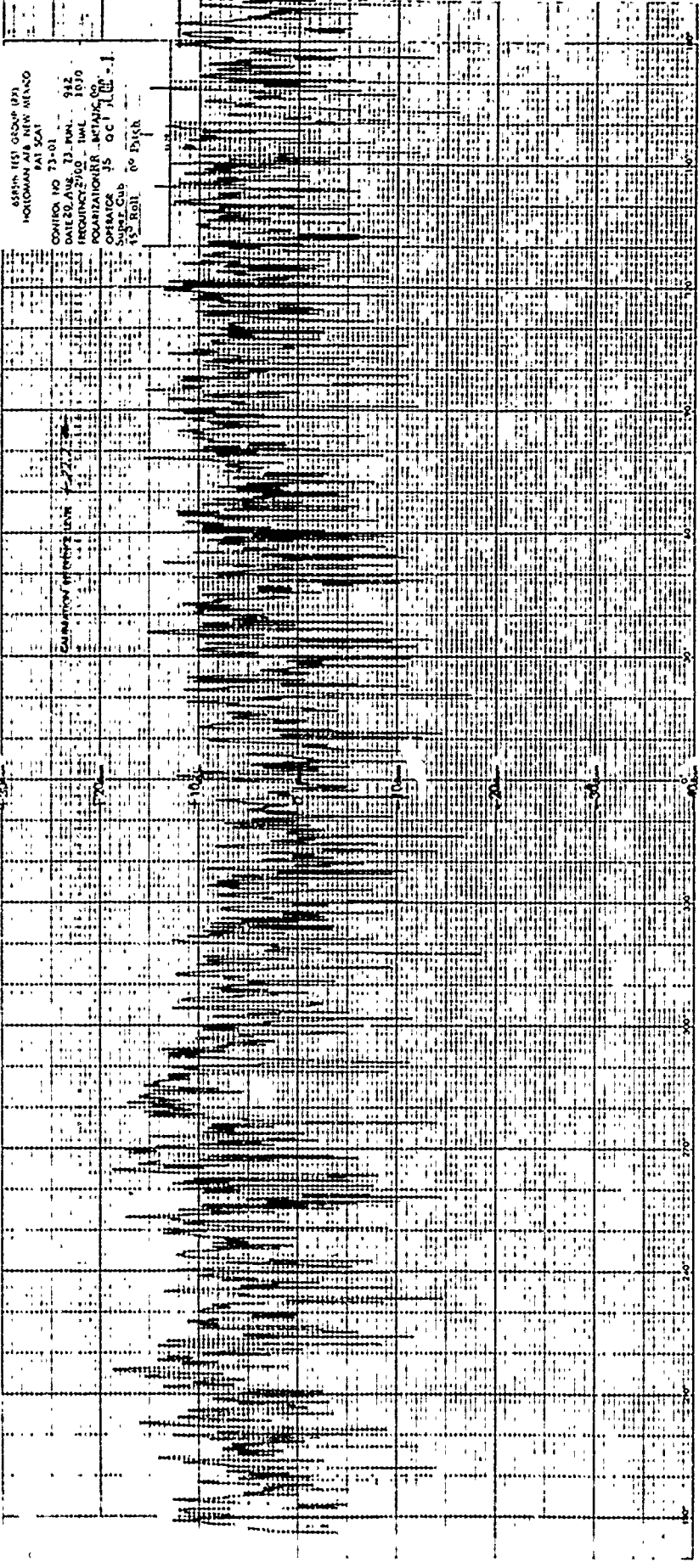
458th TEST GROUP (B3)
HOLCOMB, ALB NEW MEY-O
PAT SCAT
CONTROL NO 73-01
DATE 23 AUG 73 24H 1050
FREQUENCY 2700 TUL 1115
POLARIZATION RR EQUATING 0
OPERATOR JS O C
Super Cub
30° Roll -45° Pitch

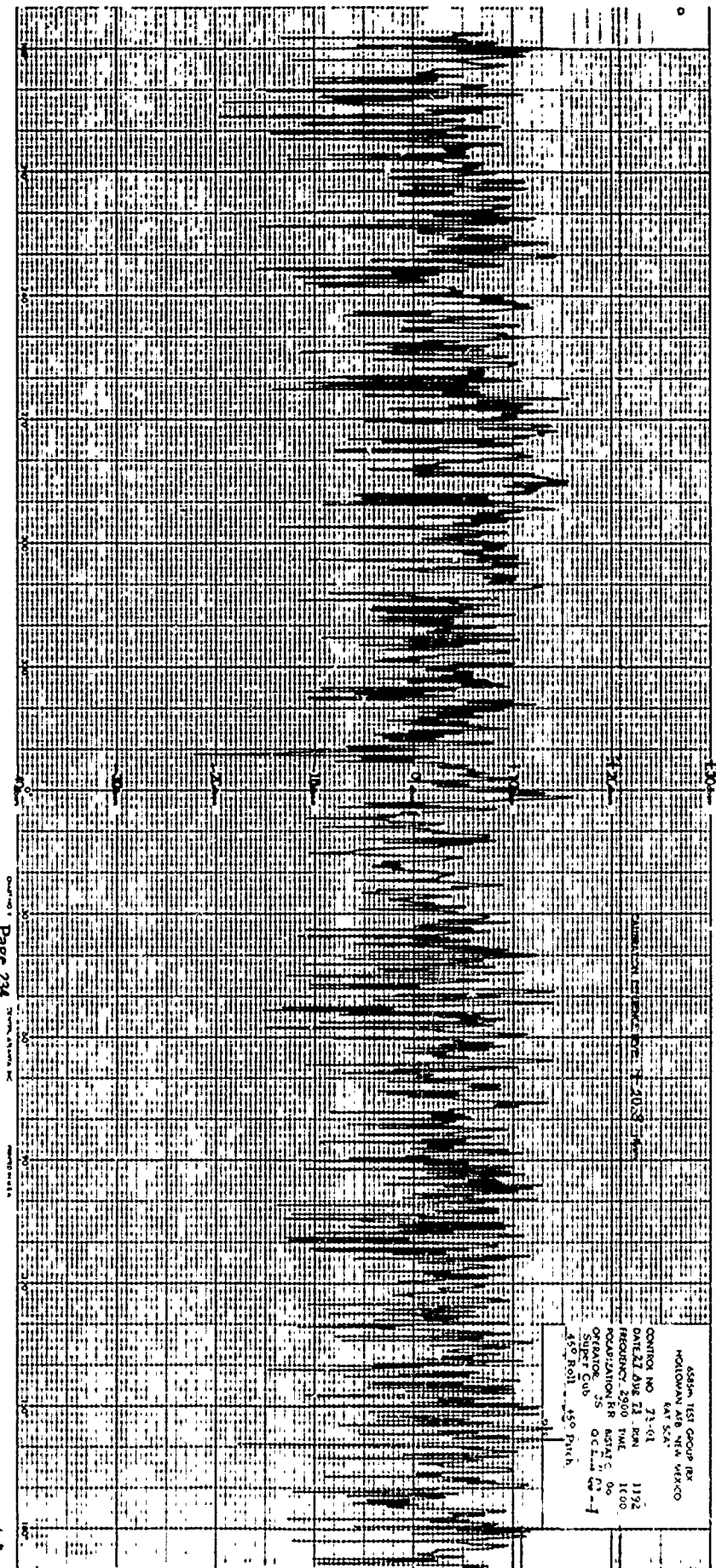


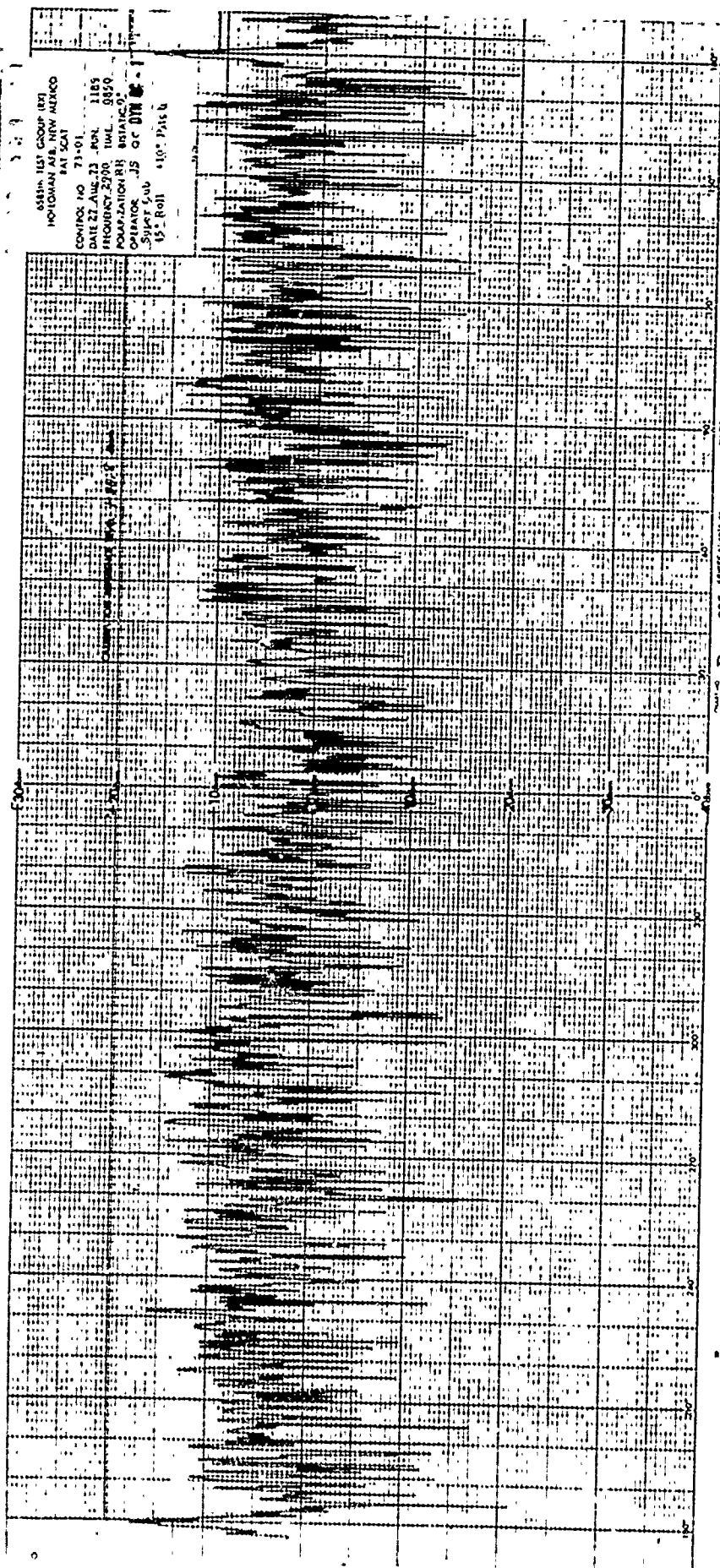
6500-151 0000 100
MONTANA NEW MEXICO
SAT 1001
CONTR NO 11-01
DATE 24 AUG 73 RIN 1161
RESIDENT 2500 TIME 1110
POPULATION 116 000000
ORIGINATOR NM OC DYN 11-1
SUPERVISOR 100 1000
100 1000 1100 1100

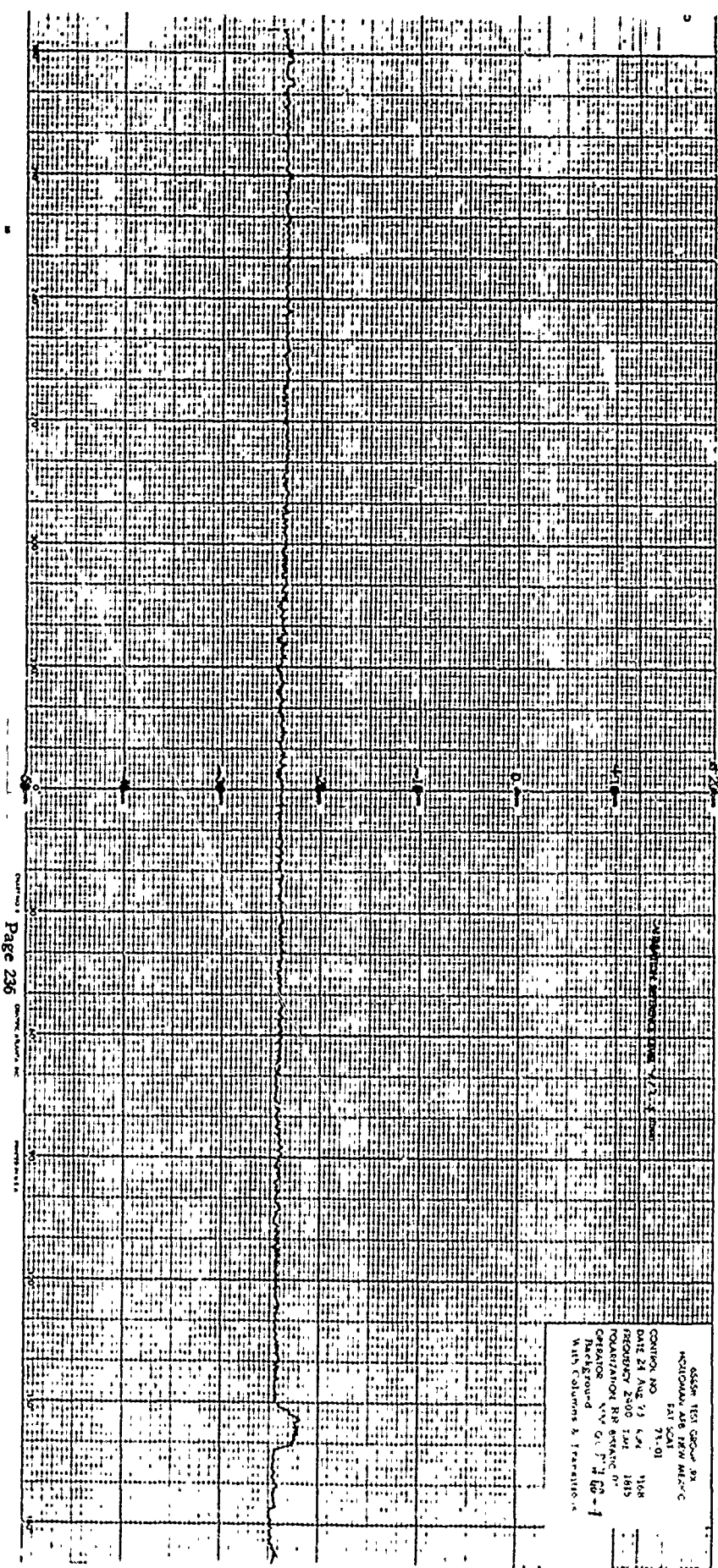


6584th TEST GROUP (P)
 HOLCOMB AFB NEW MEXICO
 PAT SCAT
 CONTROL NO 73-01
 DATE 20 AUG 73 RWL 942
 FREQUENCY 2700 - 1000
 POLARIZATION RR ANTENNA NO.
 OPERATOR JS OC 1 JUL 73
 Super Cub 60 Dyck









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ASSON TEST GROUP BY
 NATIONAL BUREAU OF STANDARDS
 CONTROL NO. 73-01
 DATE 24 AUG 73
 PREPARED BY R. J. LAM
 COOPERATION BY R. J. LAM
 REVISIONS BY R. J. LAM
 WITH COMMENTS & TRANSMISSION

6842A TEST GROUP (R)
HOLDING AREA, NEW ALCO
AT SCAT

CONTROL NO 73-01

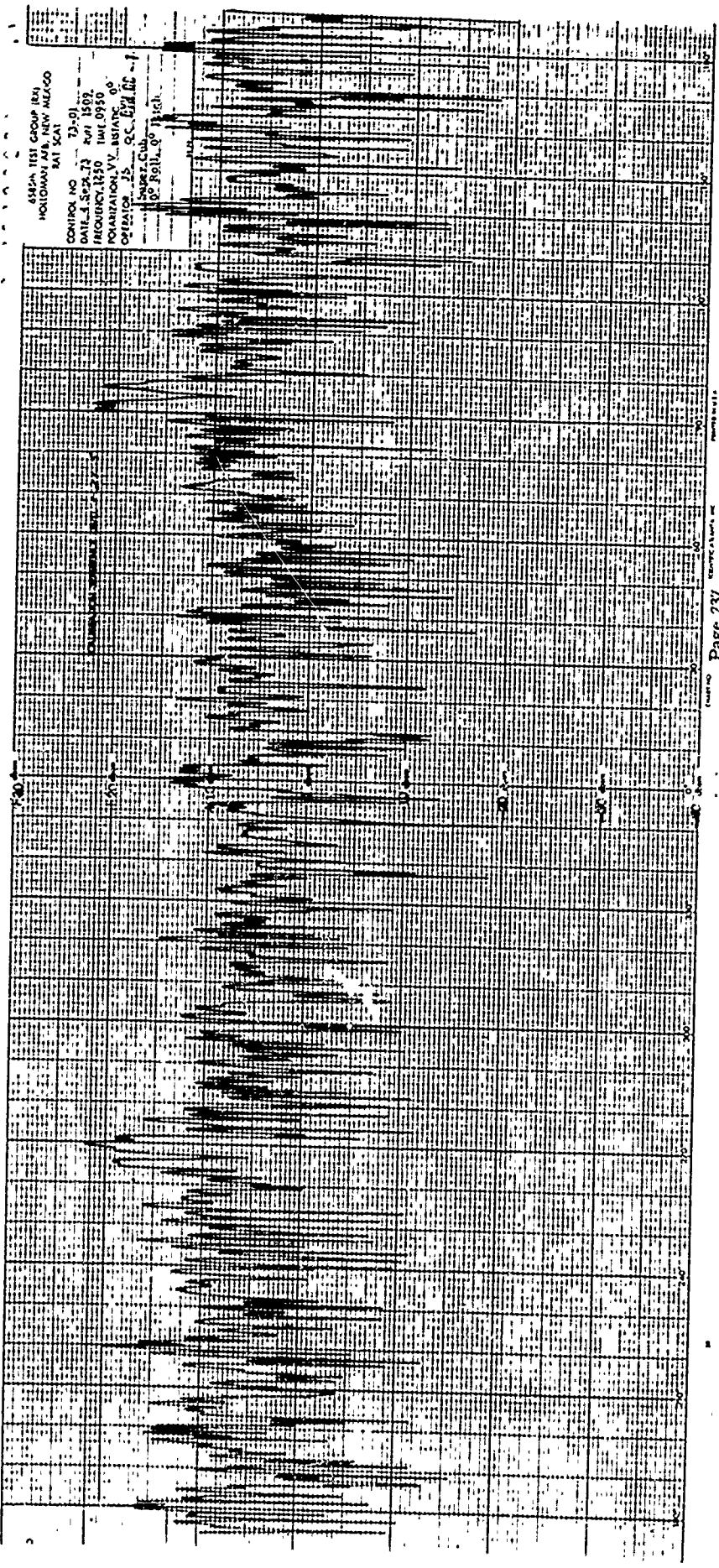
DATE 1 SEP 73 RUN 1502

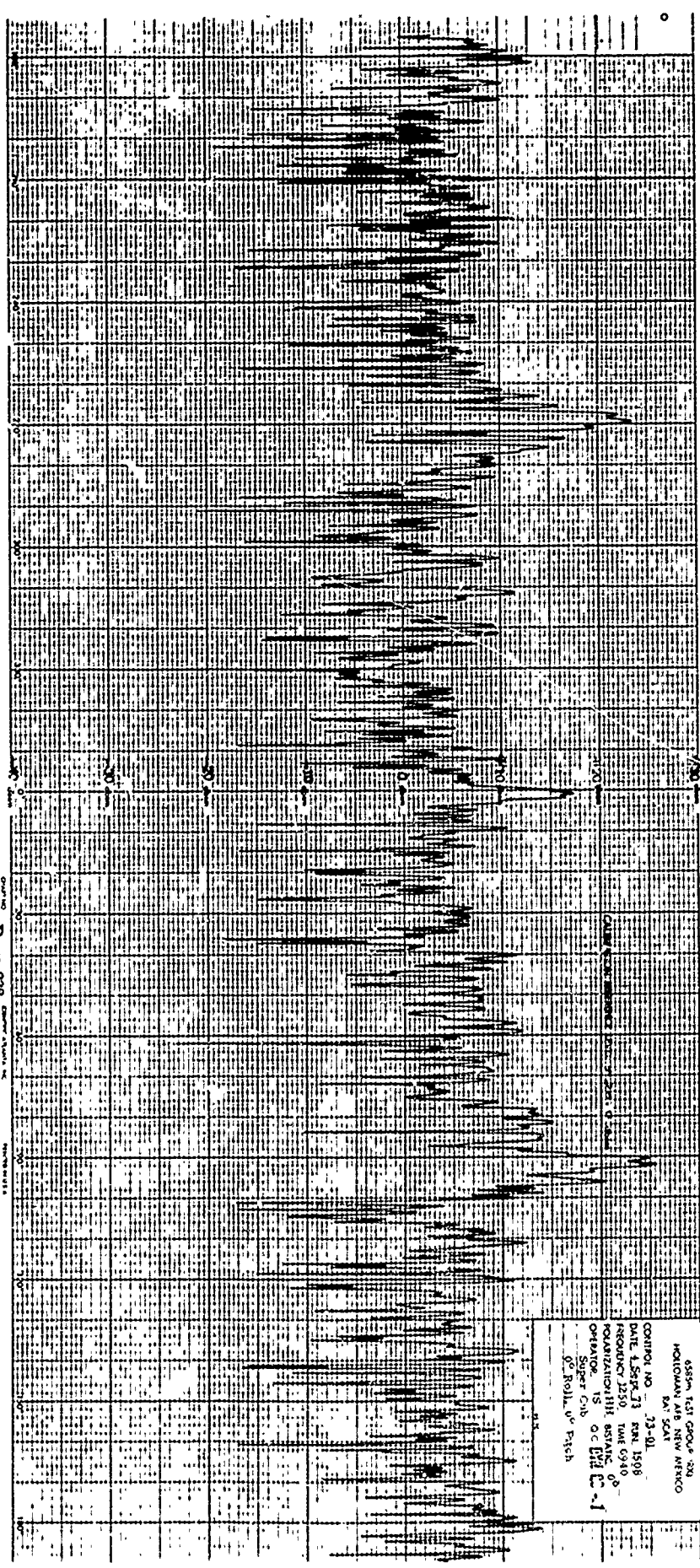
FREQUENCY 1050 TIME 0950

POLARIZATION VV, 181145C 0°

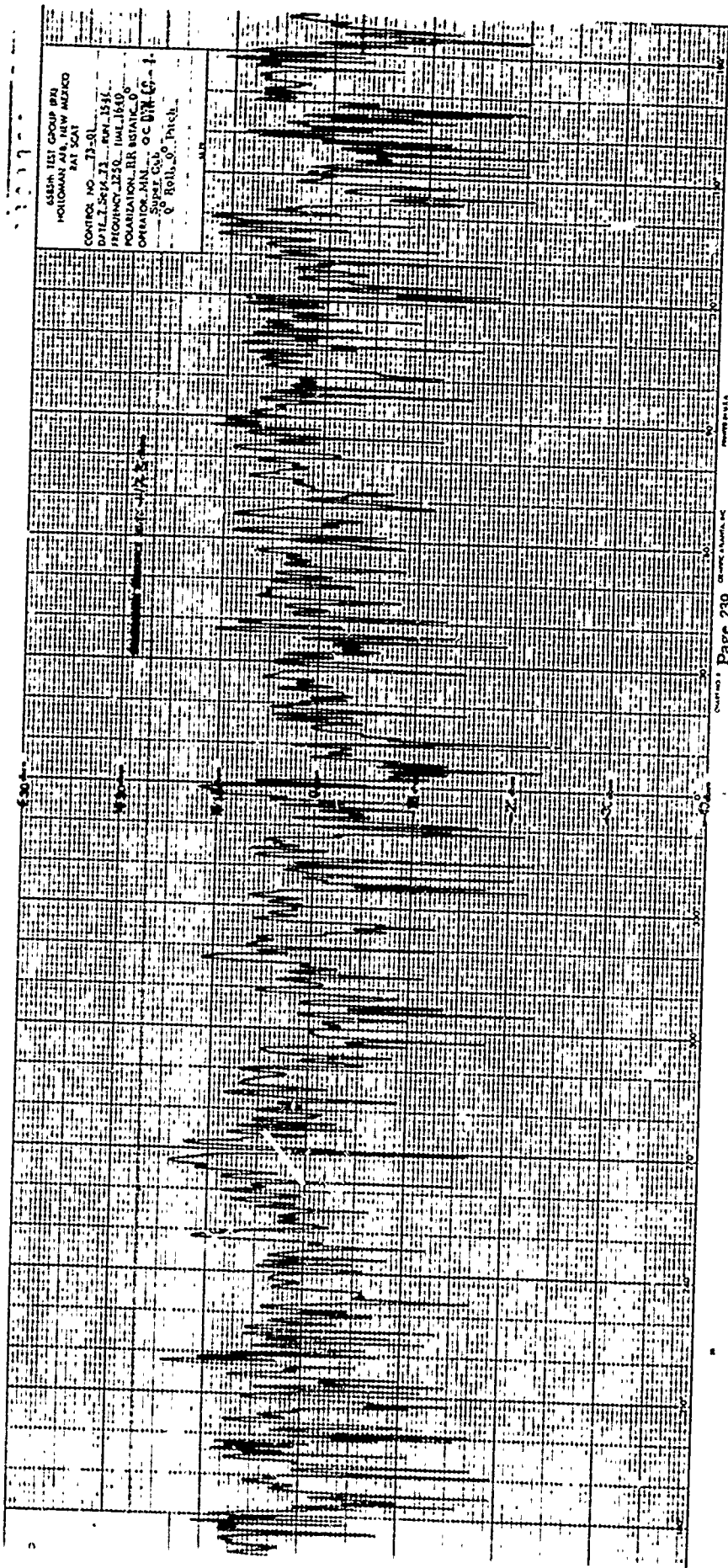
OPERATOR J. J. C. 001 001

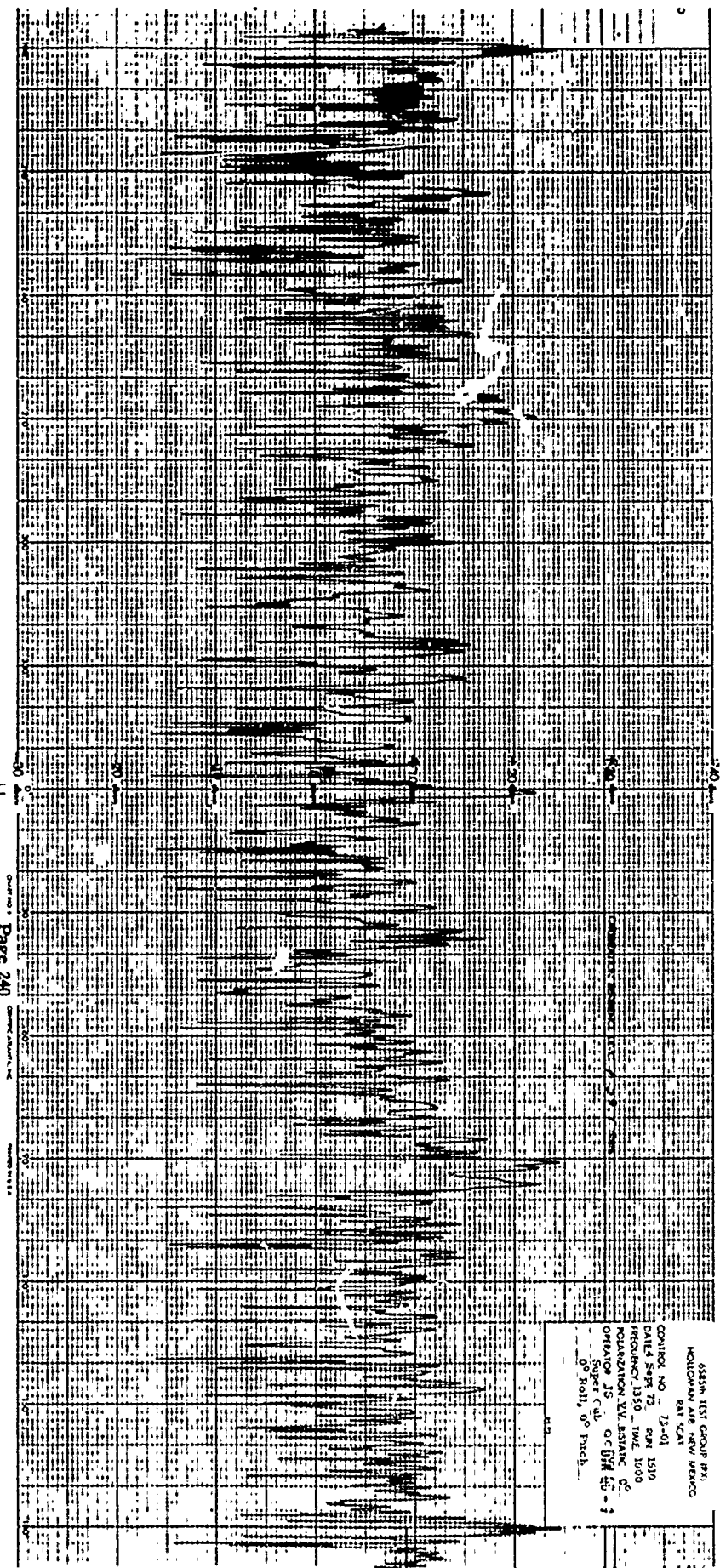
SWEEP CUB 0° Roll, 0° Pitch



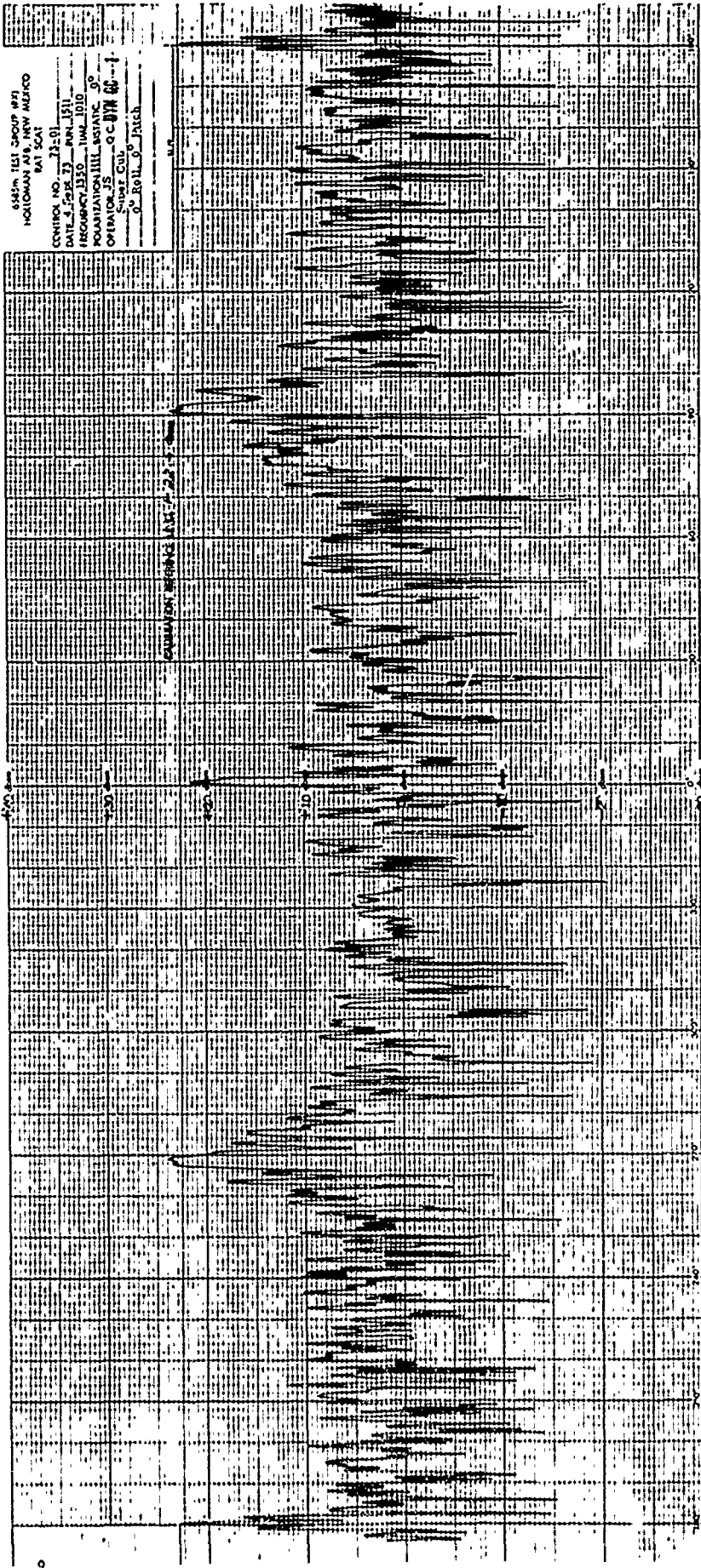


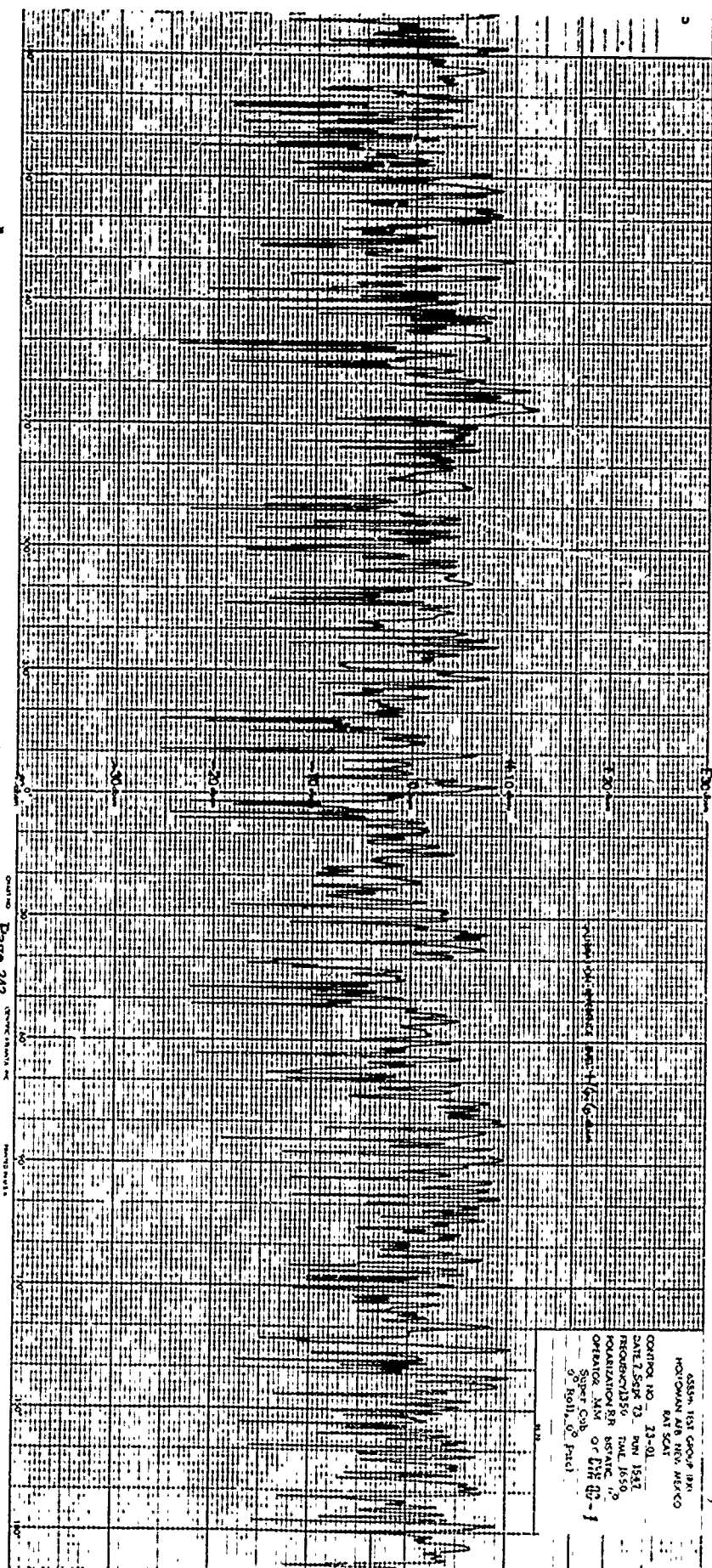
6555m EAST GROUP 301
HOLLOMAN AIR NEW MEXICO
BA SCAT
CONTROL NO. 73-01
DATE 1 SEP 73 TIME 1508
FREQUENCY 1250 TIME 0910
POLARIZATION IIII ASTANC 0°
OPERATOR TS OC PWT C-1
Super Cub
OC Roll, w Pitch



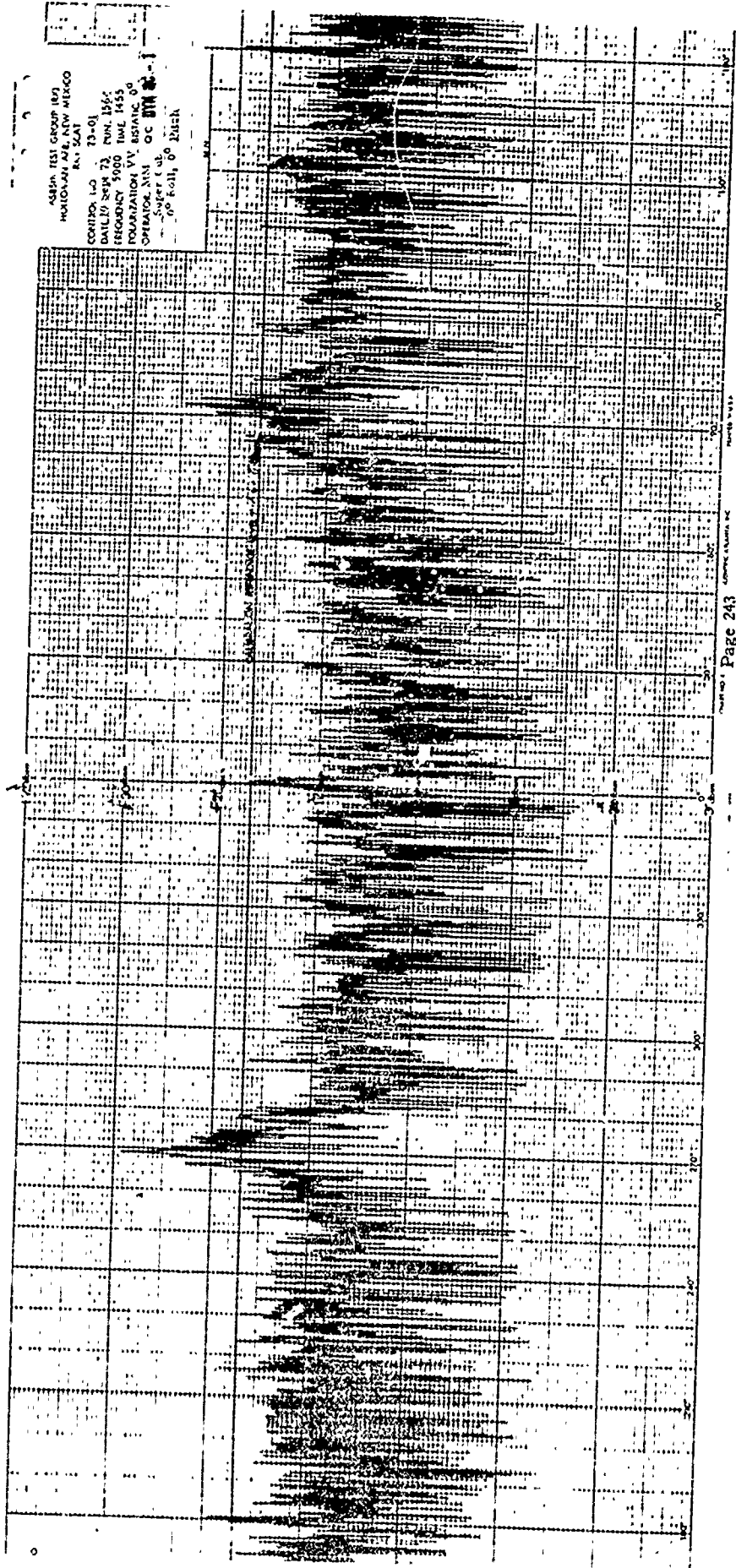


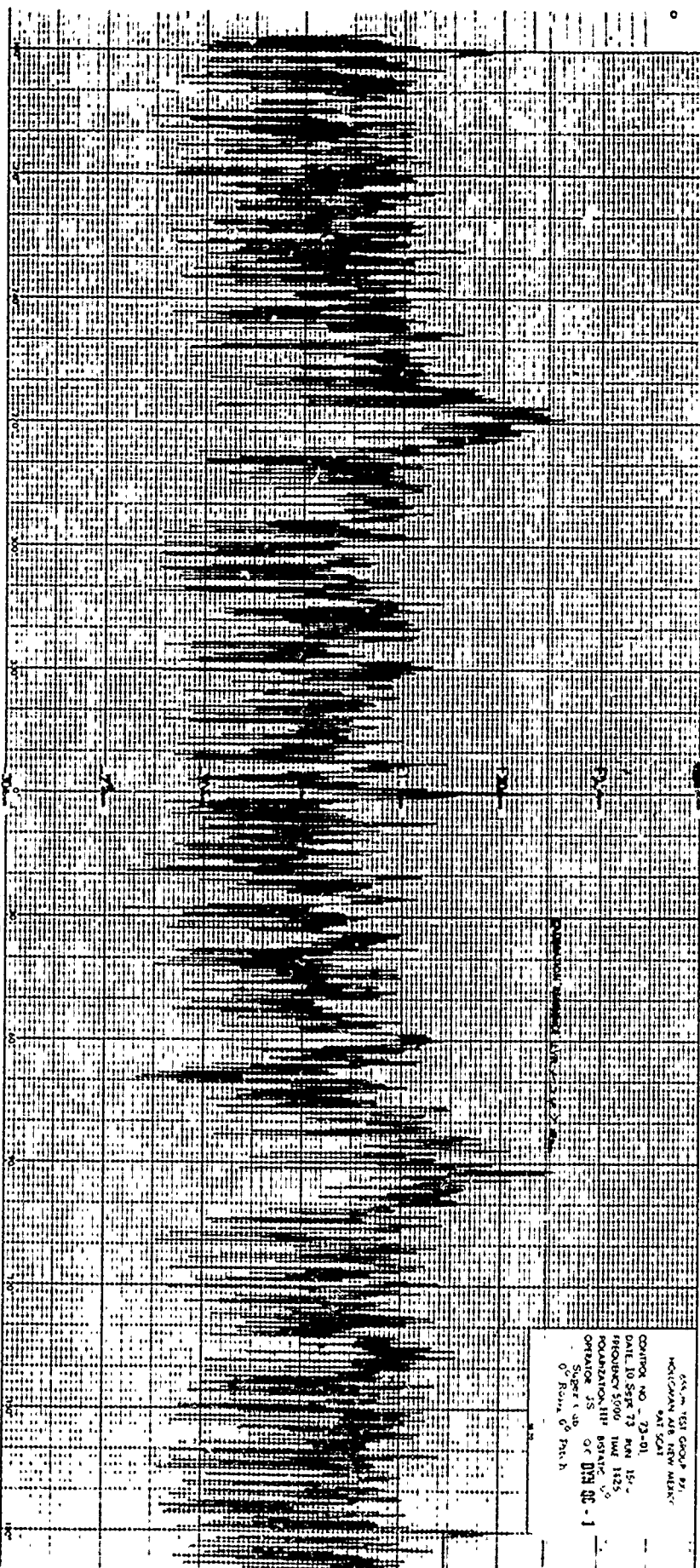
685PM TEST GROUP #23
 HOLLANDMAN #14, NEW MEXICO
 NAT SON
 CONTROL NO. 7250
 DATE 4-25-57 11:11
 FREQUENCY 130 100 100
 POLARIZATION HILL ASTATIC 30
 OPERATOR JS 0 C 811 60-1
 1st COG 0
 2nd Roll 50 Pitch





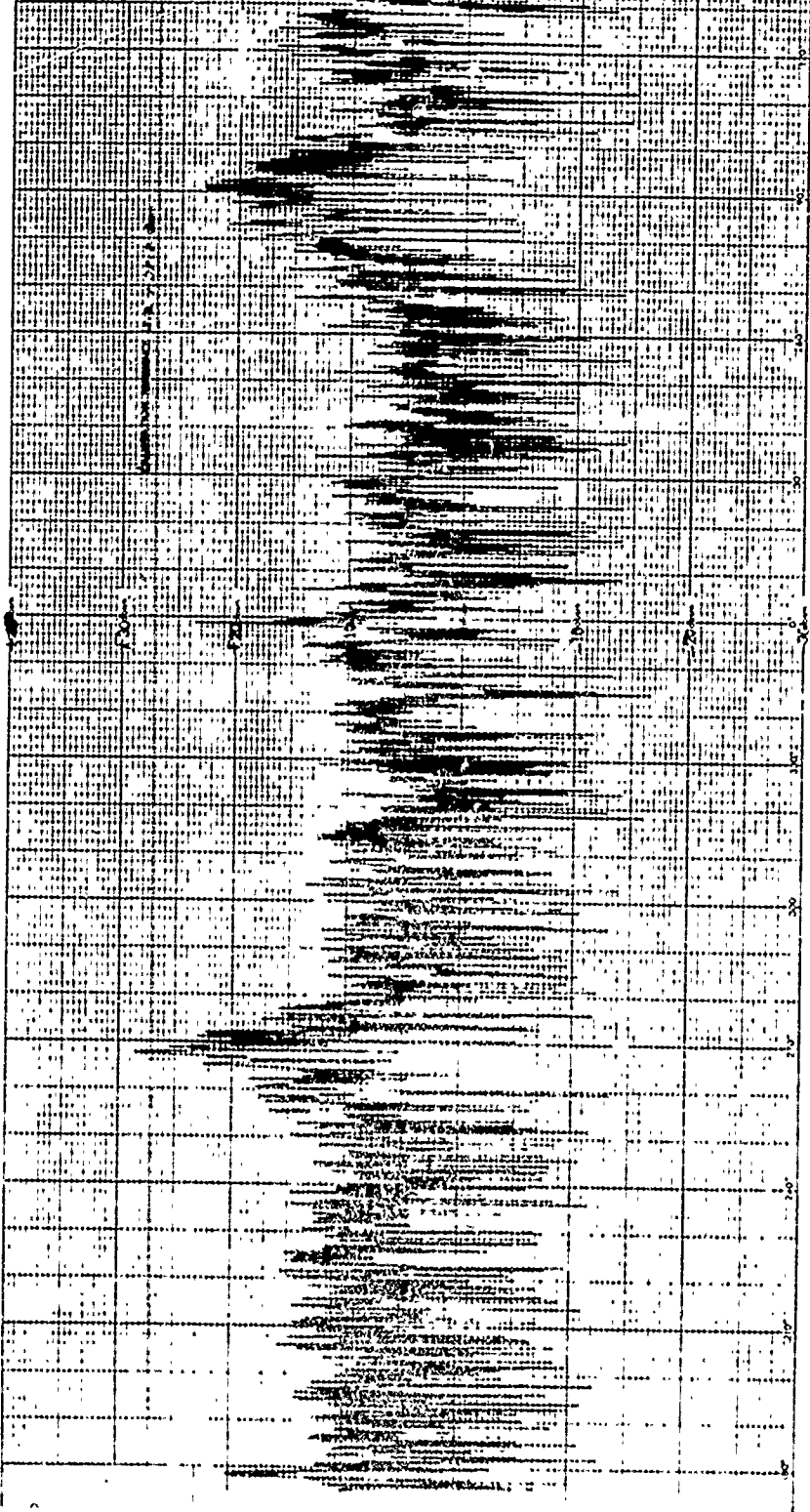
458PM TEST GROUP (M)
 HATLOMAN AVE, NEW MEXICO
 RAY SCAT
 CONTROL L.O. 73-01
 DAILY REM 72 RUN 156
 FREQUENCY 3000 TIME 1455
 MODULATION VV. STATIC 00
 OPERATOR NIN OC BTM 2-1
 Super (ub
 00 Roll, 00 Dash

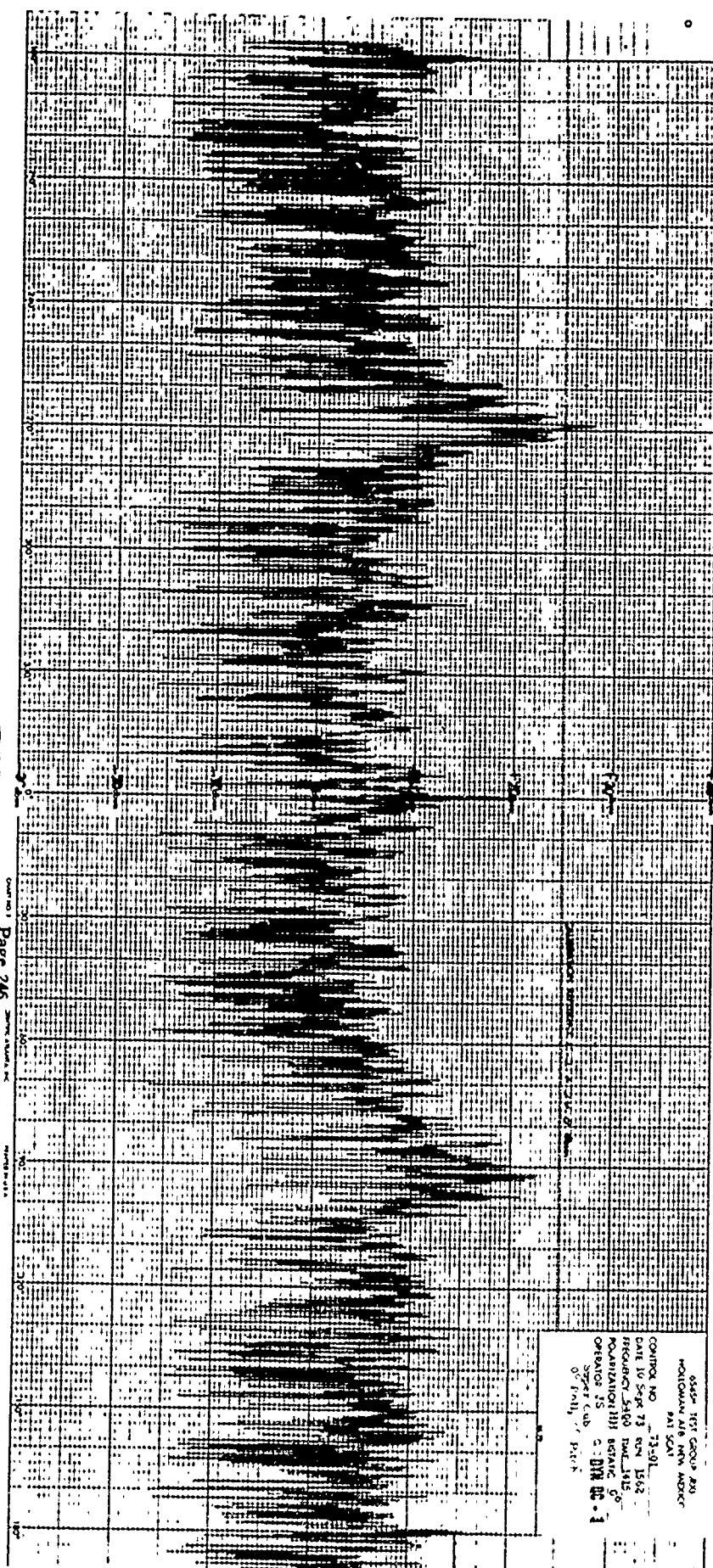




155-101 TEST GROUP 21
 MONITORING NEW MEXICO
 9-11-50
 CONTROL NO. 73-01
 DATE 10 SEP 50 RUN 15-
 FREQUENCY 5000 KHZ
 ORGANIZATION THE BOSTON
 OFFICE 35
 SUPERVISOR
 0 Range 0 Patch

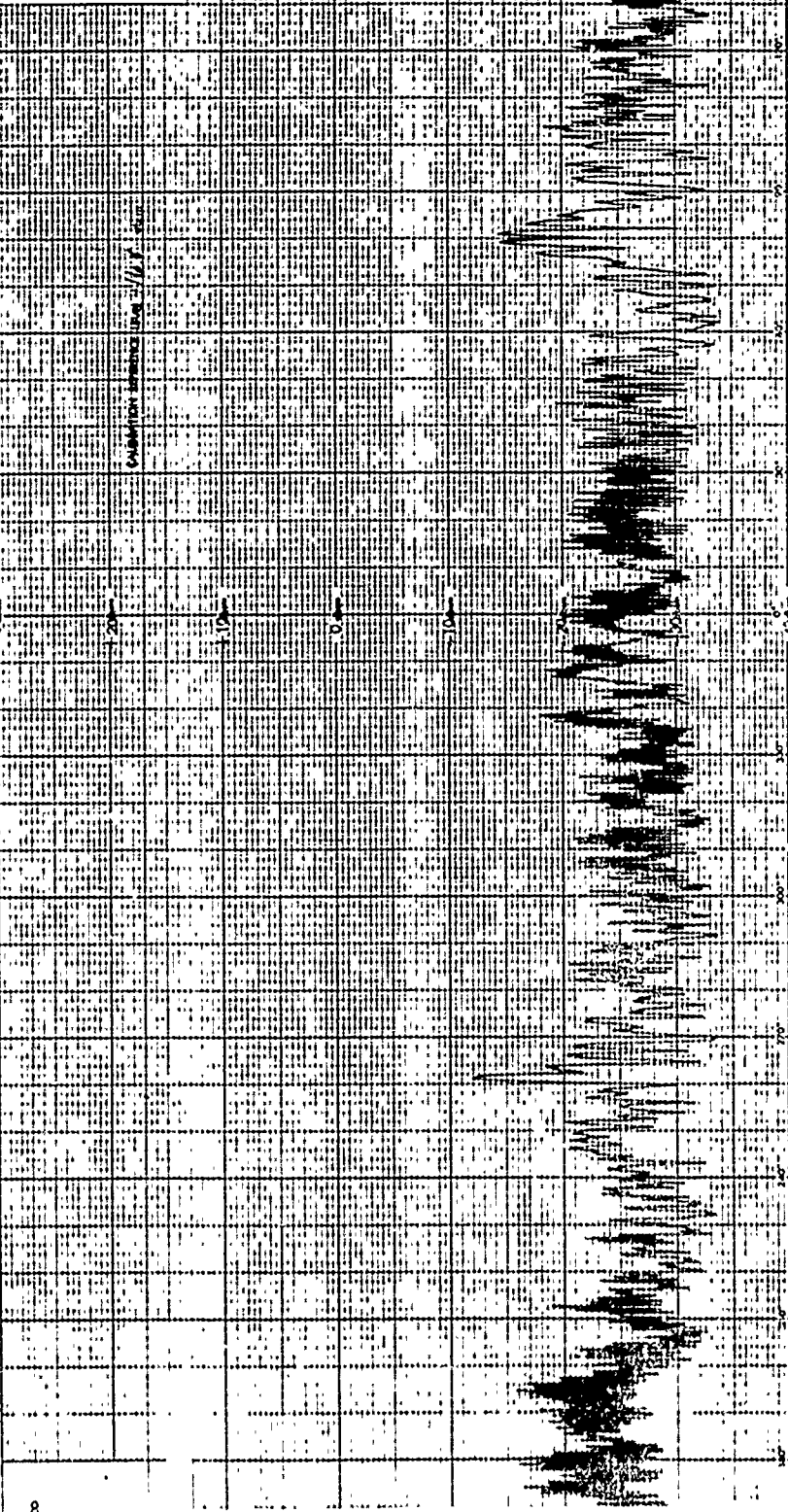
ASSIN 1111 GROUP 440
HOLCOMB AIR NEW MEXICO
FAT SCAT
COUNT NO 73-01 1361
DATE TO 27-12-73 1345
FREQUENCY 5100 1345
POSITION VV 1345
OPERATOR JS
Super Cub, CC BYH DC
6- Roll, 0° Pitch

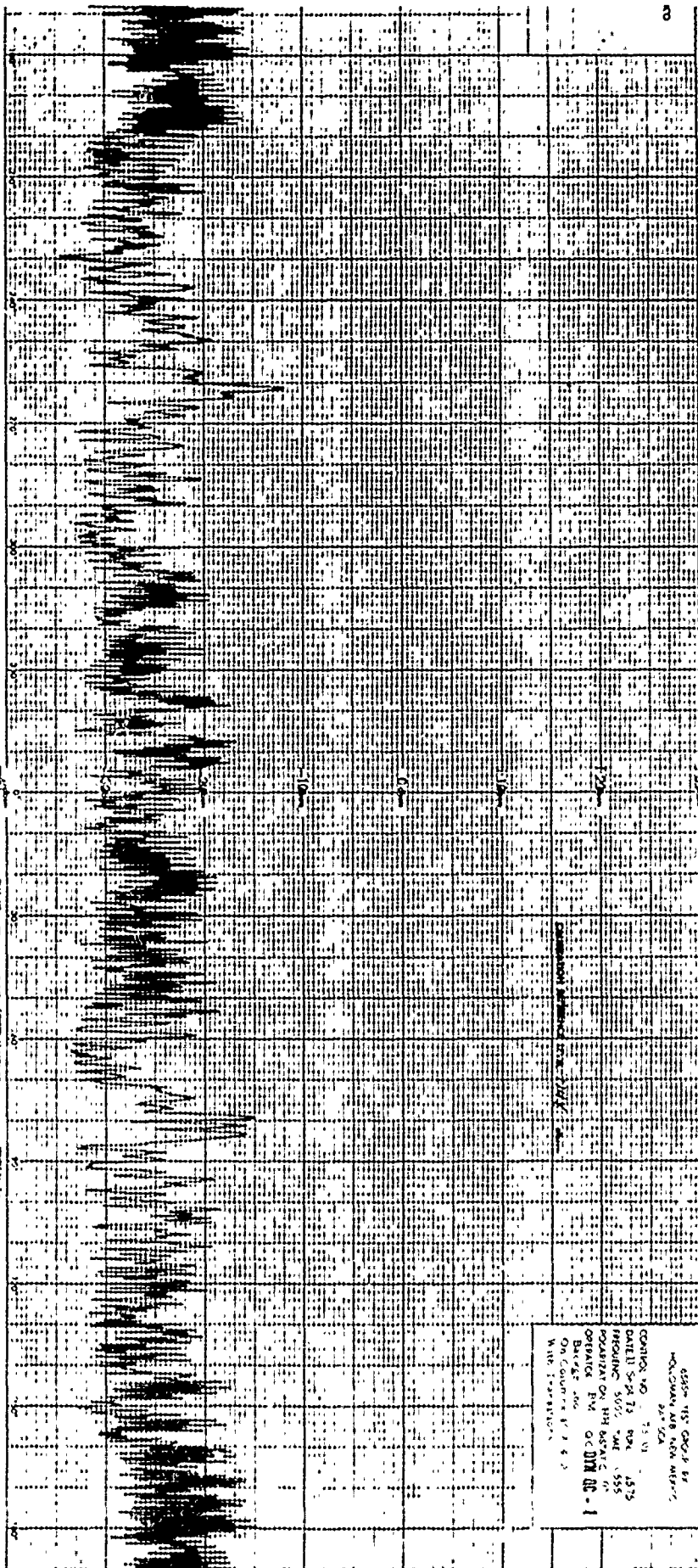




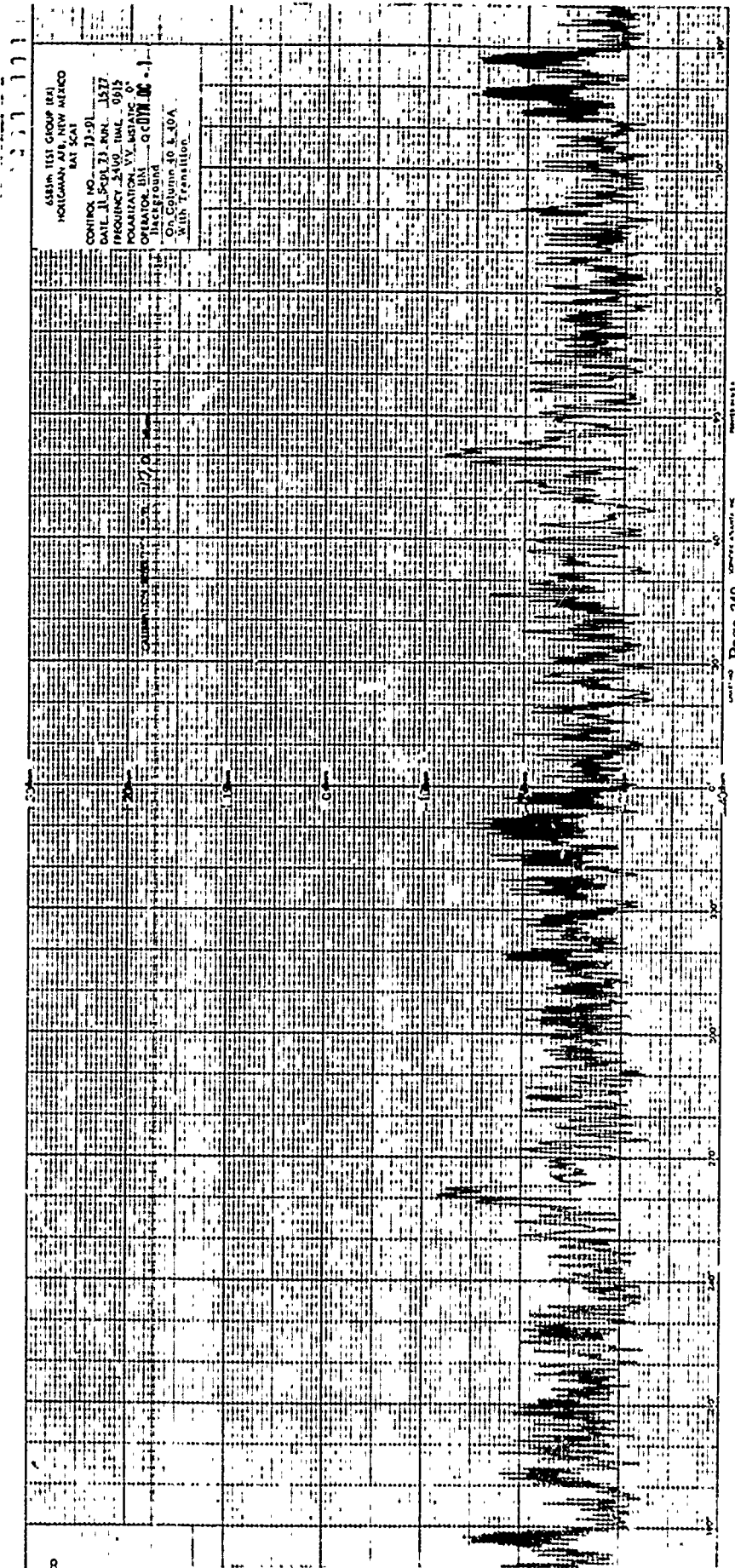
0544 1017 GROUP 231
HOLLOWAY AIR INM AMORC
PAT SCAT
CONTROL NO. 13-01
DATE 10 Sept 73 RUN 1562
FREQUENCY 5100 TIME 1415
POLARIZATION III BEARING 0°
ORBITAL 15 C: DTH 00-1
OPERATOR 1000
0° Inly, 1° Pitch

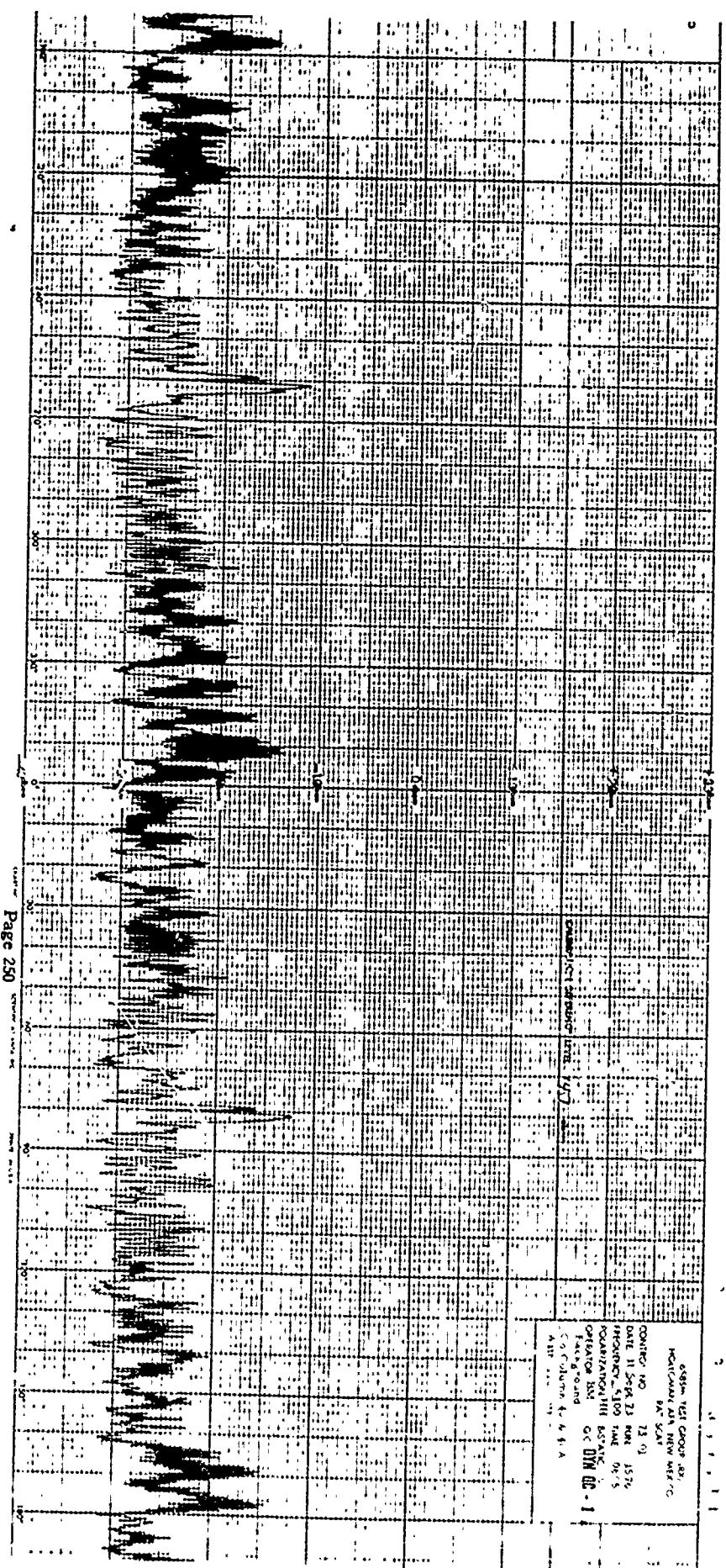
4851A TEST GROUP 181
 HOLTOMAN AIR, NEW MEXICO
 PAT 501
 CONTROL NO. 11-01
 DATE 11 SEP 73...RMA-174
 FREQUENCY 5000 Hz 0145
 POLARIZATION V...
 OPERATOR JIM OC DR 80-1
 On Column 30.2 40A
 With Transitions





6550-115 GCP-2 BY
HOLCOMB AND NEW MEANS
DATE 11 SEP 73 BY 1575
RECORDING 5000, 5401, 5555
REMARKS ON THE BASIS OF
OPERATION FWD AC DIM 10-1
BUTTER AND
ON COURSE 17 2 4 2
WITH INSTRUCTIONS





6834m TEST CHOD AB
 HOLTWAL AIA NEW WFC
 DATE 11 SEP 73 TIME 1520
 FREQUENCY 5100 KHz 04.5
 MODULATION 100% BPSK
 OPERATOR BSI
 50 Columns to 4.6 A
 1000 Hz

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APPENDIX A SITE INTRODUCTION

1. GENERAL

RAT SCAT is a static ground plane radar cross section measurement site, located on Alkali Flats near Holloman Air Force Base, New Mexico. It is authorized by the DOD for use by governmental agencies. It is under the auspices of the 6585th Test Group, Air Force Special Weapons Center, Kirtland Air Force Base, New Mexico.

A ground plane range utilizes radar energy reflected from the earth as well as radar energy traveling directly to the target through the atmosphere. When the antennas and target are adjusted to proper heights, coherent phase addition of these electromagnetic waves into a flat wave front, enhances the system sensitivity. Radar returns from objects near the earth's surface are reduced thus suppressing target area interference. Target area interference is reduced further through the use of special polyfoam support columns, radar absorptive materials (RAM), and rotators located below the earth's surface (in pits).

Pulsed transmitters are employed to enable utilization of the range gated receiving system, which can selectively measure radar returns from the target area or the range displaced transfer standard. Background interference outside the target range is eliminated by range gating. Operation without background cancellation is therefore practical.

2. CAPABILITIES

The RAT SCAT electronic equipment and controls are housed in a permanent building. Three separate range lengths (458 feet, 1158 feet, and 2458 feet) are provided for range variation as shown in Figure A-1. This allows the use of convenient antenna and target heights while satisfying the far field criterion for most targets. (Special 40-foot antenna towers are attached to the building for antenna height positioning.) Further versatility is provided by two mobile equipment vans, one for monostatic range length variation and one for bistatic measurements. A duplicate set of control and data consoles in the main building enables simultaneous operation of any two of the three ranges. A summary of the RAT SCAT characteristics is contained in Table A-1.

3. CALIBRATION

The normal method of calibration at RAT SCAT is to mount a primary standard (precision sphere) scatterer with a known radar cross section and record the corresponding signal level. Then the return from another secondary standard (corner or Luneberg lens) scatterer

A-1

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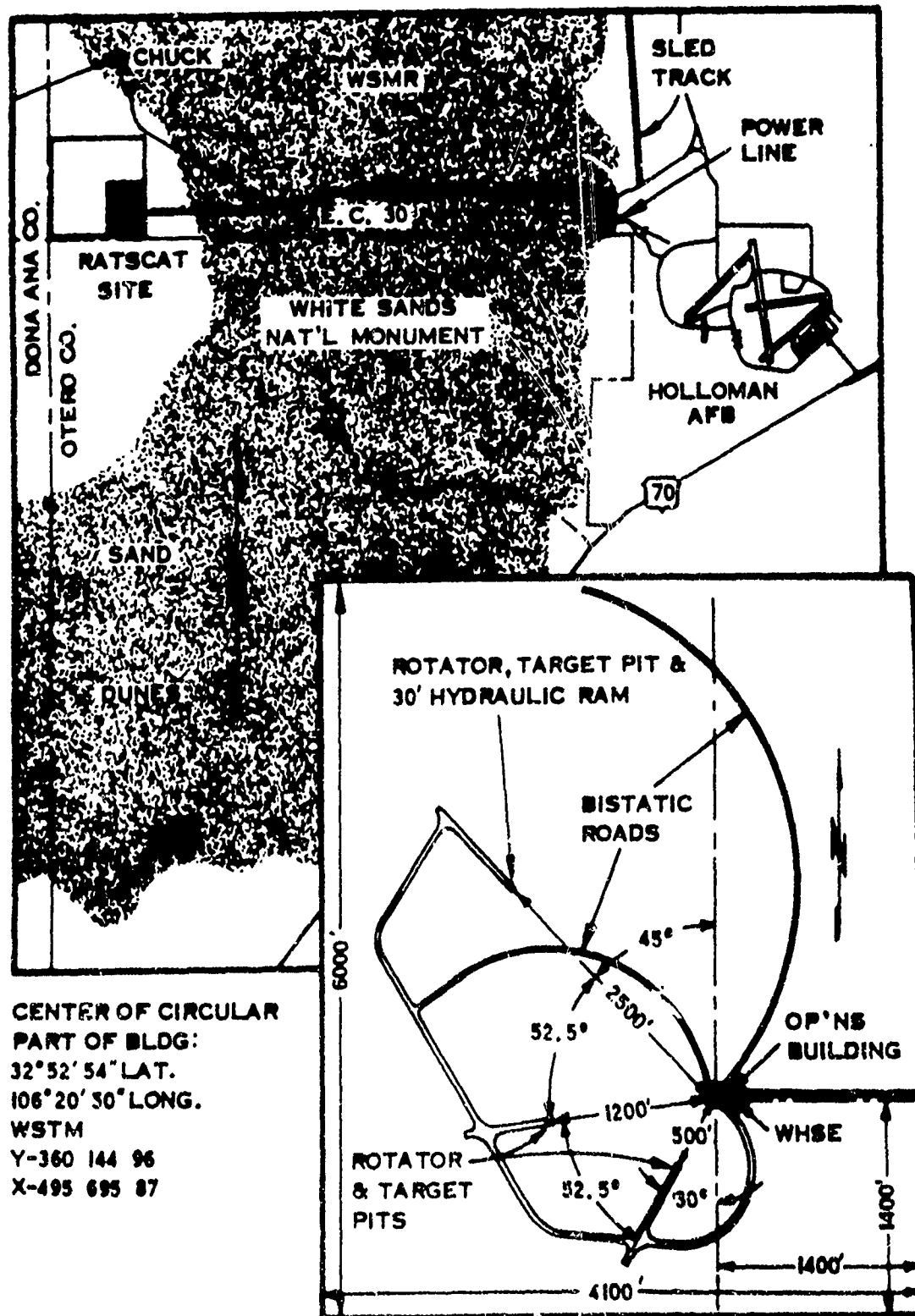


Figure A-1 MAP OF RAT SCAT SITE

A-2

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TABLE A-1

RAT SCAT CHARACTERISTICS OF ELECTRONIC EQUIPMENT

Power Output	1 KW nominal bands 1 through 8, 25 KW nominal Ku, Ka bands
Pulse Width	0.1 to 1.0 microsecond
Pulse Repetition Frequency	500 to 5000 pps
No. of Receiving Systems	Two per band, (one monostatic and one bistatic)
Receiver Minimum Detectable Signal	-94 dbm nominal
Receiver Bandwidth	2 or 10 Mhz (selectable)
Range Gate Width	0.1 to 1.0 microsecond (50 to 500 feet)
Dynamic Range	70 db
Linearity	± 0.5 db
Equipment Stability	0.1 db/hour (Average)
Analog Data Format	Polar and rectangular plots of cross section, glint and phase vs aspect angle
Digital Data Format	7 or 9 track magnetic (see Appendix C)
Antennas	1, 2, 3, 4, 6, 10, and 16 foot parabolic dishes (smaller and larger dishes available for special tests)
Antenna Feeds	Linear and circular horns with VSWR less than 2.0 to 1.0
Polarization	Horizontal, vertical, circular, elliptical in any transmitting and receiving configuration.
Background Level	As low as -80 dbsm (frequency dependent)
Background Reduction	Tuned columns and vector subtraction by using phase and amplitude measurements to reduce background by 20 db
Phase Measurement	Unique RAT SCAT capability for vector subtraction or scattering matrix applications
Azimuth Resolution	0.1 or 0.01 degree as applicable
Maximum Target Weight	40,000 pounds
Target Size	Greater than 60-foot length
Bistatic Capability	Primary ranges of 458 , 1158 , and 2458 feet for 0 to 160 degree bistatic angle
Frequency Coverage	100 to 18,000 MHz continuous, Ku, Ka bands and 95 GHz

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Band 1 - 100 to 250 MHz
Band 2 - 250 to 500 MHz
Band 3 - 500 to 1000 MHz
Band 4 - 1000 to 2000 MHz
Band 5 - 2000 to 4000 MHz
Band 6 - 4000 to 8000 MHz
Band 7 - 8000 to 12,000 MHz
Band 8 - 12,000 to 16,000 MHz

Ku, Ka bands;

95 GHz

Range Length

300 feet minimum

Building/Pit 1 - 458 ft

Building/Pit 2 - 1158 ft

Building/Pit 3 - 2458 ft

Monostatic Van/Pits 1, 2, or 3 - variable range length

displaced in range is recorded as a transfer standard. Both the precision standard return and the transfer standard return are recorded on the same plot. Thereafter, radar cross section calibration is determined by referencing the transfer standard return for every run. Thus every run is recalibrated. The comparisons of primary and transfer standards accomplished before and after each measurement series are identified respectively as calibration and post-calibration. If the direct ratio of primary to secondary readings is not maintained before and after the measurement series, then all runs between are invalid and must be repeated.

The calibration reference level marked on each data plot is related to the transfer standard level. This reference level may under controlled conditions differ from the actual transfer standard signal level since precision calibrated attenuation is sometimes inserted in the receiver line. When such attenuation is inserted, returns from the transfer standard are reduced to a level compatible with the scale used for the target measurements. The 70 db dynamic range of the plot is placed to include the range of returns expected from the vehicle being measured. In some cases two runs are necessary to be plotted for direct overlay to include the dynamic range of the vehicle if it exceeds 70 db. Calibration plots are included with the target data when requested by the user.

The sphere calibration plots will not necessarily be straight lines. If the background return is within 20 db of the sphere return, for example, a variation in sphere return of approximately 1 db can result. For calibration the sphere is intentionally placed at least 1/2 wavelength off the center of table rotation to insure sufficient phasing with the background return. The average sphere return is then chosen for a calibration level. This avoids the peak errors involved with coherent addition of sphere return and background return and allows the minimum errors involved with non-coherent addition of the returns. This is indicated in Figure A-2.

4. OPERATING PROCEDURES

The following step-by-step procedure is standard in obtaining monostatic radar cross section measurements after frequency, feeds, antennas, antenna height, target height, and pit (range length) have been chosen:

1. Calibration - As described in previous section.
2. Horizontal and vertical probes (field strength measurements at the target area) - Horizontal probes at the target area have been shown to be redundant for azimuthal boresighting. For this reason, these probes are taken only upon request for examination of near field effects.

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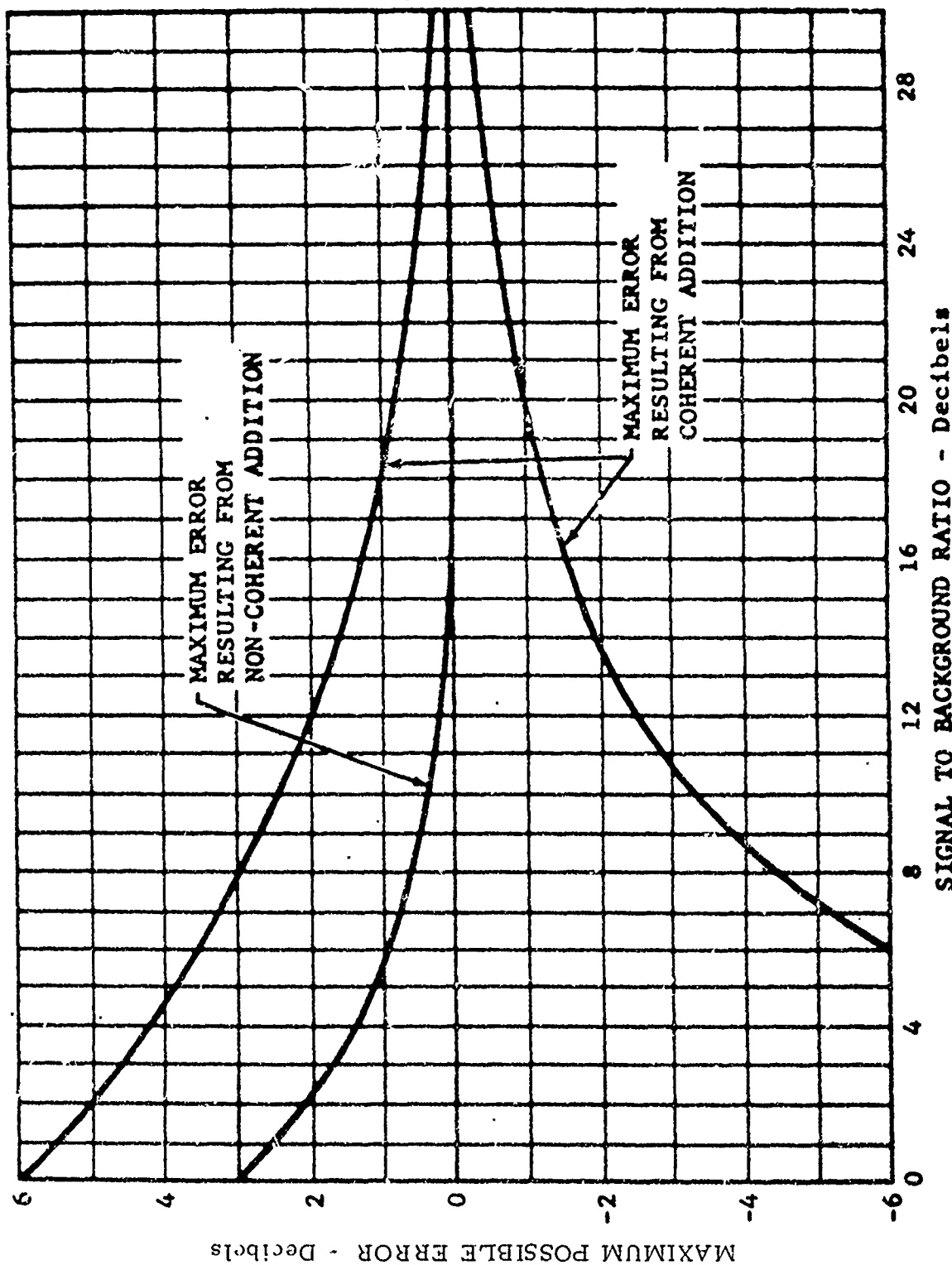


Figure A-2 PLOT OF ERROR INDUCED BY BACKGROUND INTERFERENCE

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Vertical probes are taken at the target area to determine power variation as a function of target height. If necessary, antenna height is varied to obtain an acceptable vertical probe which then necessitates a new calibration.

3. Background - The background level with the target mount in place is measured in each polarization to be used.
4. Measurement - The measurement is made with the vehicle in the position previously occupied by the primary standard.
5. Calibration - The primary calibration is repeated to verify calibration (post calibration).

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APPENDIX B
TARGET ORIENTATION AND DATA FORMAT

1. COORDINATE SYSTEM

The coordinate system described herein has been adopted as a standard for RAT SCAT operations. The system is referenced both to the vehicle being measured and to the measurement site.

a. Vehicle Reference

A three-axis system, referenced to an arbitrary vehicle, is illustrated in Figure B-1. In this system three mutually perpendicular planes (yaw, pitch, and roll) are passed through the vehicle so that the pitch and yaw planes mutually intersect on the longitudinal axis of the vehicle. These planes remain fixed with respect to the vehicle, regardless of vehicle rotation with respect to the radar or ground plane. The yaw plane, which includes the pitch axis and the roll axis, is numbered from 0 degrees to 360 degrees in a clockwise direction when the vehicle is viewed from above. The nose-on aspect corresponds to 0 degrees, the starboard side of the vehicle corresponds to 90 degrees, and the port side to 270 degrees. The pitch plane, which contains the roll axis and the yaw axis is numbered from 0 degrees to ± 180 degrees; the $+90$ degree point is below the center line, and the -90 degree point is above the center line. The roll plane contains the yaw axis and the pitch axis. It is numbered from 0 degrees to 360 degrees, and the numbers increase in a counterclockwise direction when the vehicle is viewed from the rear.

b. Site Reference

As previously stated the coordinate system is fixed with respect to the vehicle. It is referenced to the site by means of three index marks. The exact value of any of the three angles is determined by noting the value of the vehicle coordinate opposite the index marks. Index marks come from such devices as bubble levels, inclinometers and transits.

As illustrated in Figure B-2, the index for roll angles is normal to the axis of rotation. As illustrated in Figure B-3, the index for pitch angles is normal to the axis of rotation and in line with the apparent source of radiation. For measurements at the RAT SCAT Site, targets can be mounted to provide desired pitch and roll angles.

c. Coordinate System Tilt

For small targets another angle, tilt, can be utilized in recording useful data. This angle, equipment-limited to less than 15 degrees, is formed by the axis of rotation and the normal to the line of sight to the

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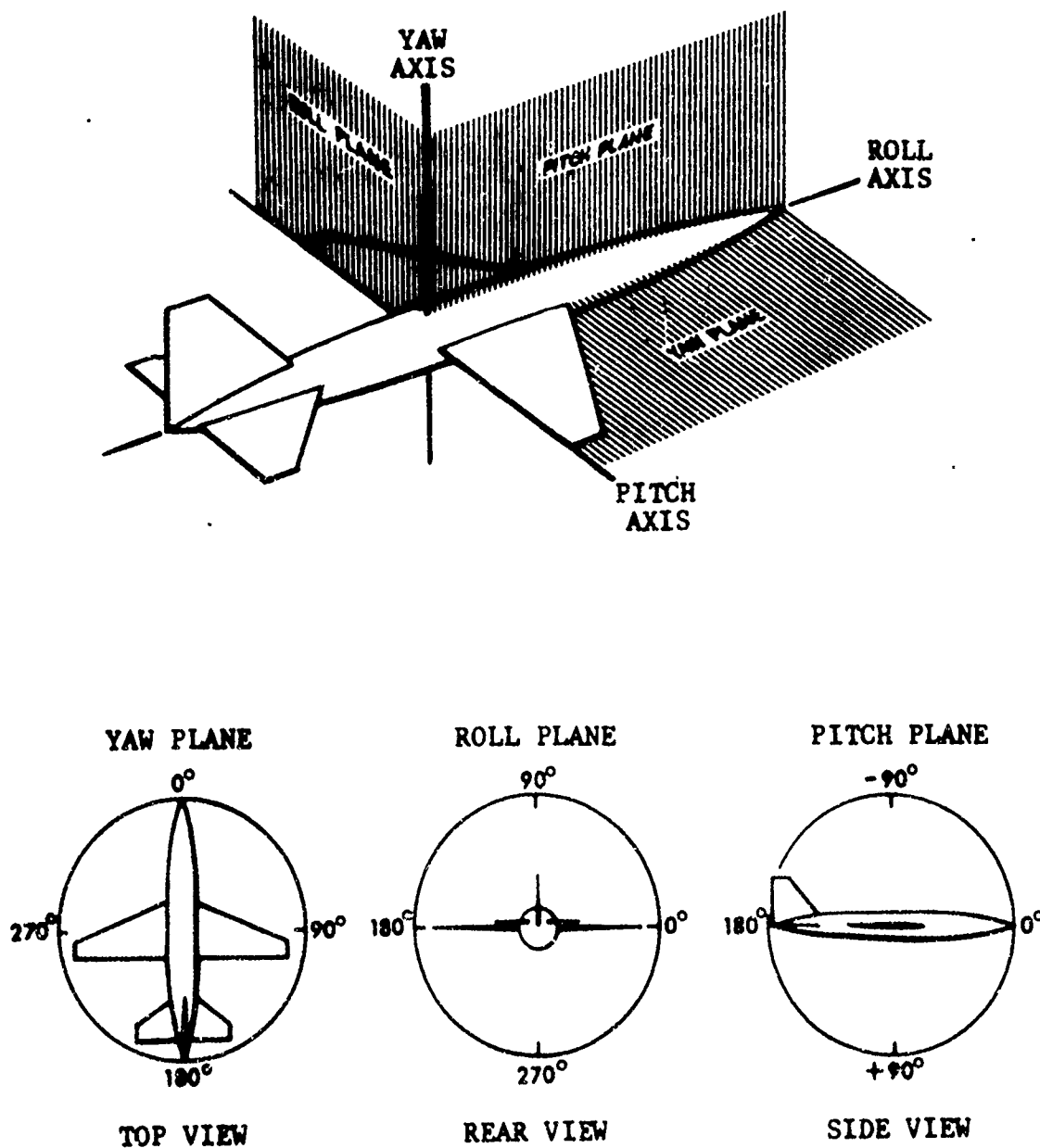
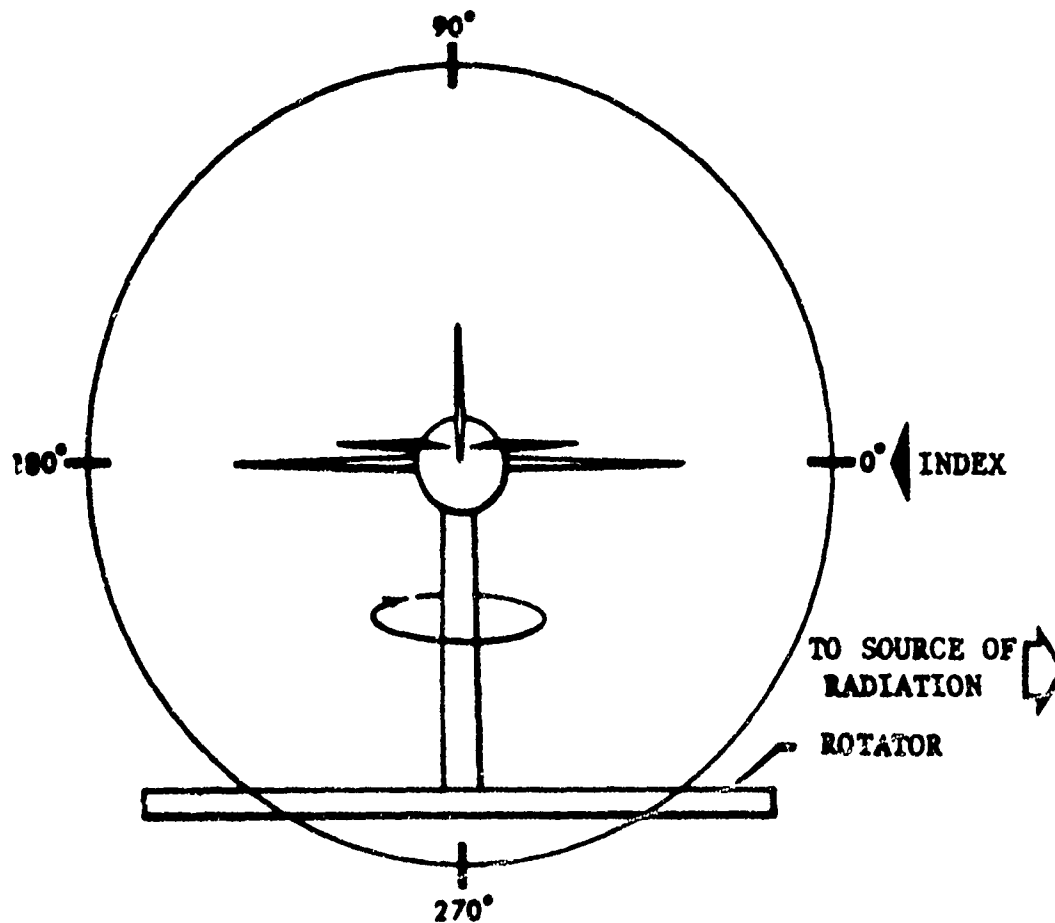


Figure B-1 VEHICLE COORDINATE SYSTEM

B-2

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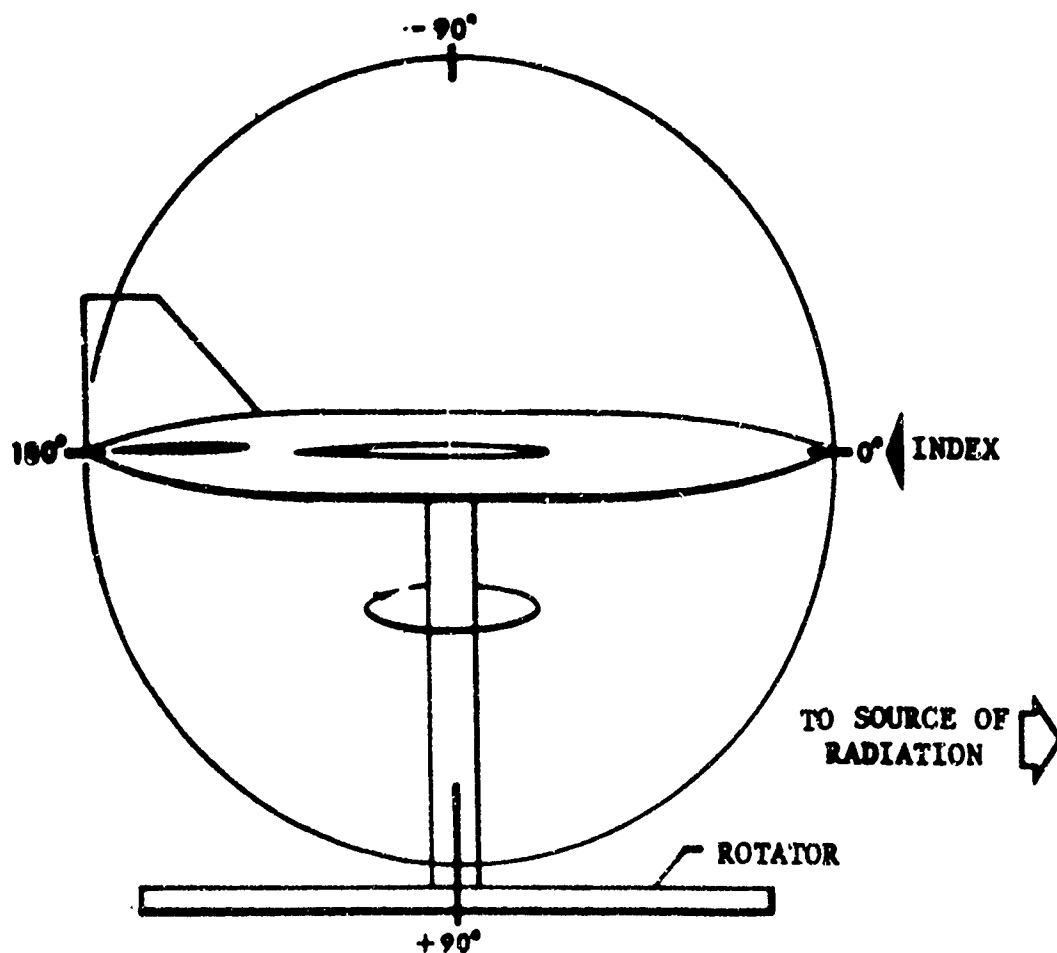
NOTE: The roll scale is fixed to the vehicle. The amount of roll is determined by noting the number of degrees opposite the index. Clockwise rotation of the target (when viewed from the rear) increases the roll angle.

Figure B-2 TARGET ORIENTATION - ROLL

B-3

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NOTE: The pitch scale is fixed to the vehicle.
The number of degrees of pitch is determined
by noting the scale value opposite the index.

Figure B-3 TARGET ORIENTATION - PITCH

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apparent source of radiation. Since, in a ground plane range, radiation can be considered to emanate from a point with zero height directly beneath the antennas, a zero-degree tilted axis of rotation is slightly off the geometrical vertical. This small deviation from the geometrical vertical is neglected in the following discussions.

A target mounted with a pitch angle other than zero displaces the yaw axis from the vertical, but not the axis of rotation. The axis of rotation is displaced from the vertical only when non-zero tilt is employed. Tilting toward the radar is considered positive tilt and away from the radar is negative tilt. For monostatic measurements tilt will be measured in the vertical plane containing the line of sight between the radar and the target. The difference between pitch and tilt is shown in Figure B-4.

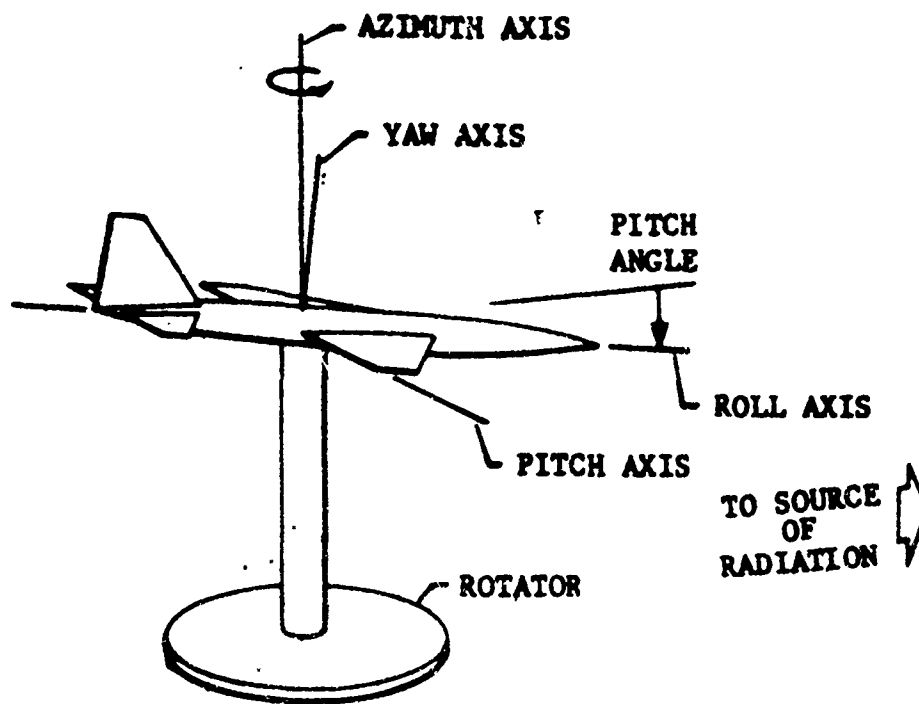
2. DATA FORMAT

Data recorders obtain azimuth angle information by means of precision synchro signals from the position of the rotating table. The line of sight from the antennas to the center of the rotator, as illustrated in Figure B-5, indexes azimuth angles. As used here the term azimuth refers to the position of the target rotator table. With zero degrees of pitch and roll, azimuth and yaw are identical. It is standard practice to turn the rotator in a clockwise (cw) direction as viewed from above. Consequently, the azimuth angle varies, for example from 180 degrees (tail-on) to 90 degrees (starboard-side) to 0 degrees (nose-on) to 270 degrees (port-side).

a. Polar and Rectilinear Plots

Essential information pertinent to each plot is contained in the information block located in the upper right hand corner of the rectilinear plots and in the second quadrant of the polar plots. Each rectilinear plot has the recording of the return from the left side of the vehicle on the left side of the plot, 0 degrees at the center, and the recording of the return from the right side of the vehicle on the right side of the plot; 180 degrees (tail-on) appears at the right and left extremities of the plot, as shown in Figure B-6. Since the paper moves from left to right under the recorder pen, it should be noted that measurements are limited at 180 degrees in order to obtain continuous measurements on the recorder paper. The table on the polar recorder is rotated in the same directions as the target so the 90-degree point appears on the right side of the polar plot, the 270 degree point on the left, and the zero or 360 degree point at the top of the plot.

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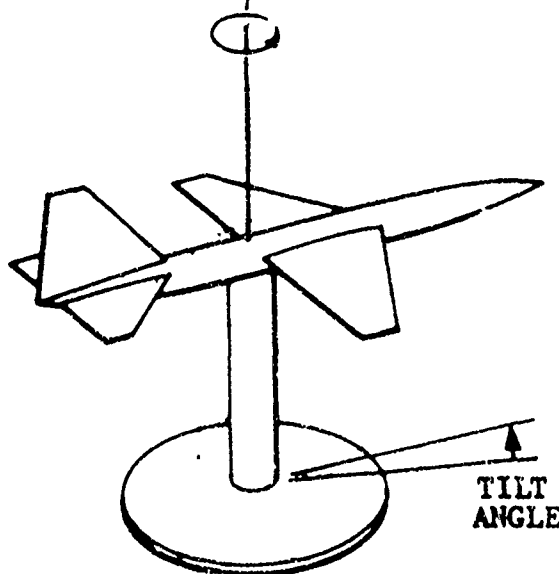


PITCH

NOTE:

Axis of rotation is
always collinear
with Azimuth Axis

AZIMUTH
& YAW AXIS



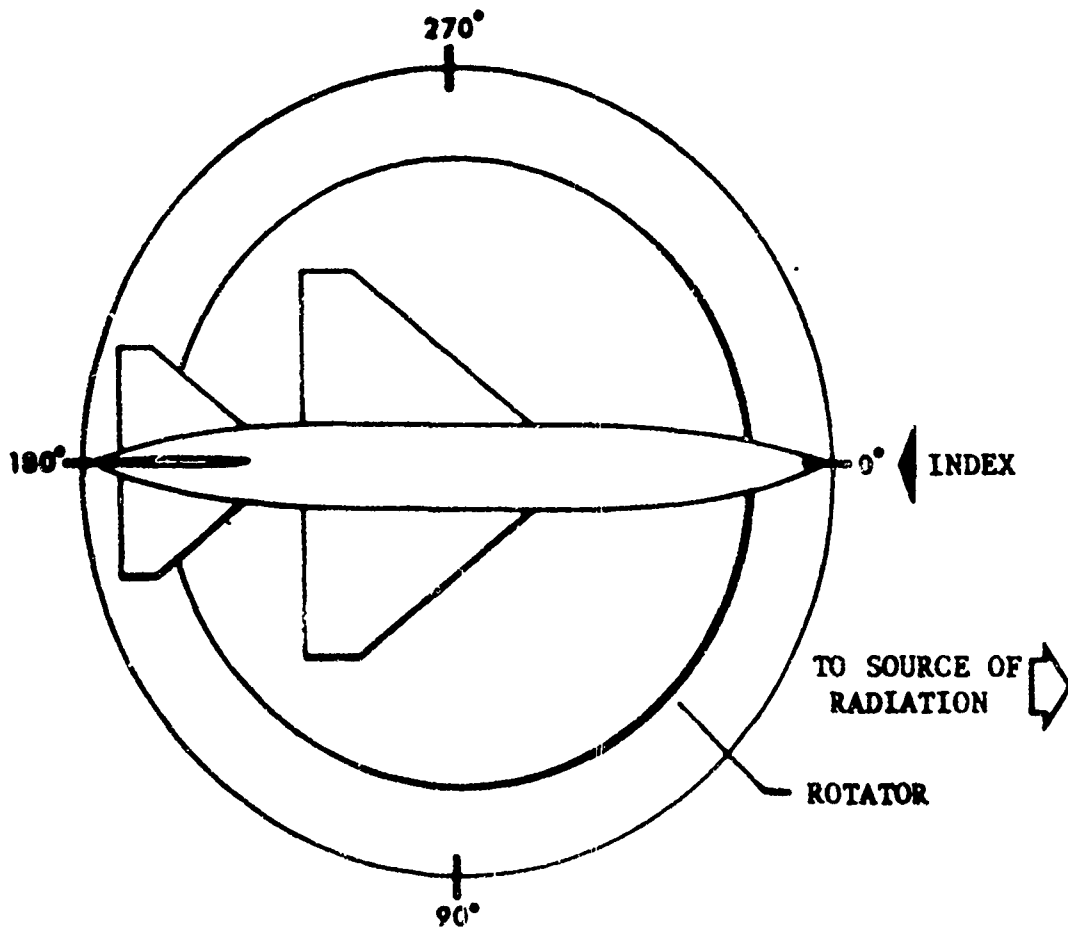
TILT

Figure B-4 COMPARISON OF PITCH AND TILT ORIENTATIONS

B-6

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NOTE: The azimuth scale is fixed to the target rotator. The azimuth value is determined by noting the value of the scale opposite the index mark as the rotator and scale revolve. The index is the line-of-sight from the radar antennas to the center of the rotator. (Azimuth angle data are transmitted to the data recorders by means of synchro signals.) The standard direction of rotation will be clockwise.

Figure B-5 TARGET ORIENTATION - AZIMUTH

B-7

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RECTILINEAR
RECORDER

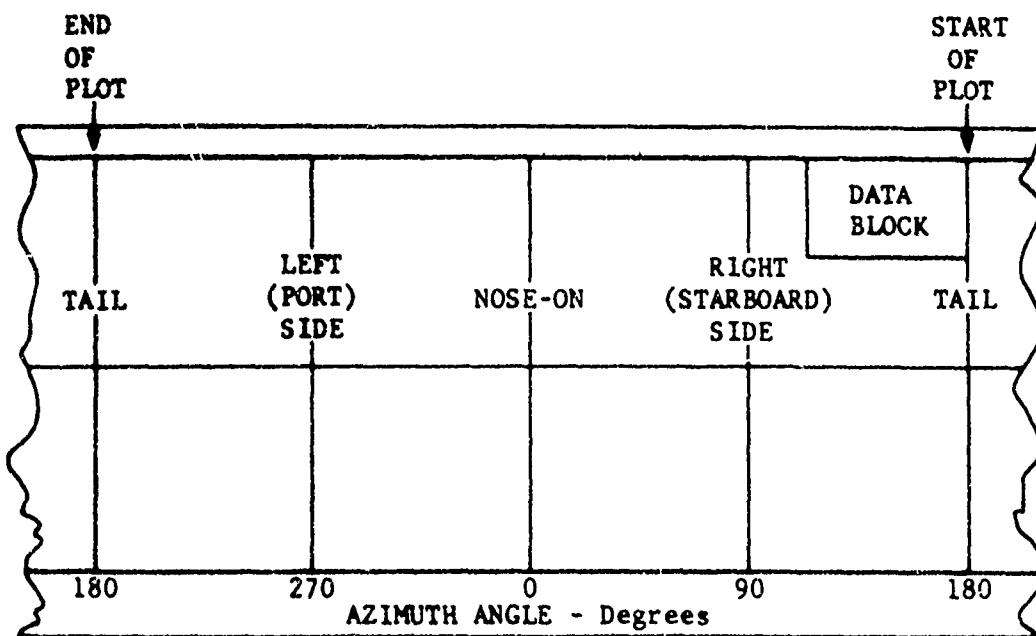
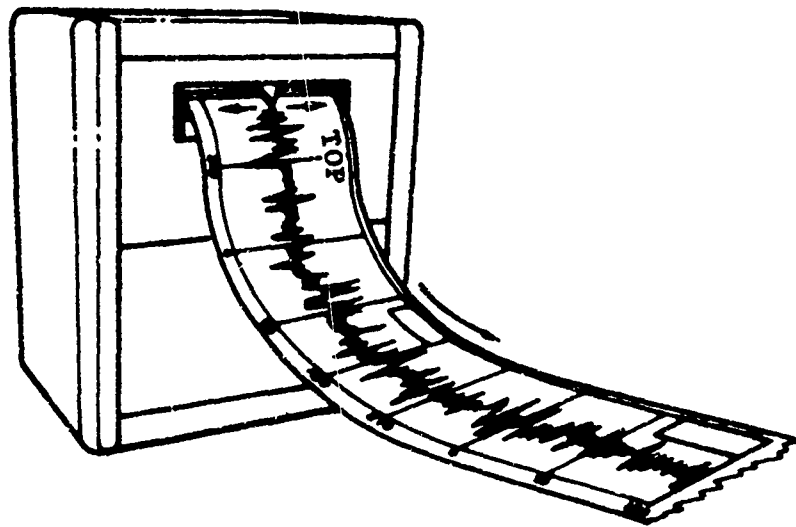


Figure B-6 FORMAT FOR RECTILINEAR PLOTS

B-8

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